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ABSTRACT

This compendious study was undertaken to consider how to deal with increasing student enrollments and decreasing higher education budgets so that students would not suffer unduly from program reductions. The study includes Part I, Perspective, considering the changing purposes and goals of higher education and recommending strategies for changes expanded upon in subsequent parts; Part II, Some Alternative Arrangements for Higher Education, with sections on A More Efficient Allocation of Higher Education's Resources, The Affluent Librarian, A New Concept of College and University Administration, U-Net - The University Network, The Urban University, and Higher Education and the World of Work; Part III, Surveys of the Current Scene, including a discussion of A Short History of Higher Education, Options and Issues Concerning Grading in Higher Education, Curriculum Change, Increase University Teaching Effectiveness, Voluntary Cooperation for Effective Resource Allocation in Higher Education, Cooperative Education in Colleges and Universities, Management in Institutions of Higher Education, Can Mathematical Models Contribute to Efficiency in Higher Education?, Allocation of a University's Resources to Instruction, Innovation in Private Colleges and Universities in California, The Computer in Higher Education, and Television in Higher Education; Part IV concludes the study with a 114 page bibliography. (WVM)

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MORE SCHOLARS PER DOLLAR

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Report Prepared for

Ford Foundation

and

Carnegie Commission on Higher Education

by

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February 1, 1971

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ACKNOWLEDGEMENTS

This document reports on a study which was undertaken at the invitation of Joseph Kershaw of Williams College, who was at the time a program officer of the Ford Foundation, and Clark Kerr, Chairman of the Carnegie Commission on Higher Education. Their particular concern in commissioning the study was the fact that higher education enrollments were increasing faster than higher education budgets. It seemed to them, in view of the disillusionment of the general public with higher education, that budget stringency was certain to get worse and possibly severely cripple higher education in its efforts to accomplish its educational mission. Their injunction to us was that we search out ways that might substantially improve the efficiency of higher education so that students would not suffer unduly as a result of reduced budgets. They made it clear that we should not spend time looking for ways that might pick up bits and pieces; we were to try to concentrate on ways that had some chance of bringing about large increases in efficiency.

The study was carried out by the Public Policy Research Organization of the University of California, Irvine. It consumed eighteen months and $180,000.00 supplied by Ford ($130,000.00) and Carnegie ($50,000.00). Quite a large number of persons worked at one time or another on the study and I here attempt to state who they were and what they did. It is not really possible because it was a team effort during which members were continually changing the minds of other members. I, as project director, deserve full credit for all the failures of the enterprise. I was extremely fortunate

during the early days of laying out the study to get help from four distinquished Irvine professors: Dean George W.Brown, Professor Robert Dubin, Dean James March and Professor Richard Snyder. The two deans were too busy to give it much time but that little was most valuable; both Professors Dubin and Snyder stayed with us during a considerable portion of our first summer and made fundamental contributions to our thinking about the whole matter of efficiency in higher education.

Three regular staff members of the Public Policy Research Organization provided the leadership and general direction of the work. William Haldeman devoted full time to it and was the real anchor man throughout the study. Robert Bickner, Research Economist, and I devoted about half time to it; a fourth staff member, Research Psychologist John Kinzer, was not a regular participant but was tremendeously helpful from time to time. Bickner is our soundest thinker and was kept thoroughly busy the whole time trying to retrieve us from nonsensical forays into fantasyland; he probably doesn't think he was very successful.

The bulk of the work was done by a dedicated team consisting mostly of Irvine graduate students, who were especially recruited for the project and who devoted half time to it during the academic year and full time to it during two summers. They are Lawrence Bogard, Joseph Connors, Craig Harlan, Erwin Kim, Mary Lynch, and Henry Markus. Bogard obtained his M.A. degree during the course of the project and became a full time participant thereafter. A number of other young people participated in the study for shorter periods of time: Helen Brownlee, Wade Bunting, William Crampon, David Georgi, Michael Harrington, Michael Krisman and Mark Slafkes. Three consultants made very substantial contributions: Colin Bell, Charles Carey and Joseph McCloskey.

Some authors are listed on the title page of this report. The list is a bad compromise but we could not think of a better one. It consists of everyone who can recognize at least a few pages of his own writing in the report. A great deal of other writing was done--high piles of it in fact--and it supplied the raw material for what does appear in the report, but most of that too was written by the persons who have been listed as authors. Another bad compromise would have been simply to list all the persons I have named above but that would have included persons who were involved briefly or had relatively little effect on the study. With regard to primary authorship of the chapters, I was mainly responsible for the actual writing of Chapters 1,4,5,6,7,8 and 14, but they are clearly mostly summaries and expositions of the total team effort. Robert Bickner was the author of Chapters 2,3,9 and 16. William Haldeman was the author of Chapters 13,19, and 20 and gave considerable aid to the authors of other chapters. Lawrence Bogard was in charge of a mail survey we made of institutions of higher education to explore managerial efficiency and reports the results of that in Chapter 21; he is also the primary author of Chapter 10. Charles Carey wrote much of Chapters 11 and 15, helped out with Chapter 6 and undertook the job of editing the whole report; Barbara Cohen assisted him with Chapter 15. The Urban University presented in Chapter 12 is the joint effort of Joseph Connors and Mary Lynch. Mary Lynch also wrote Chapter 18. We had three representitives of the Third World on our team but only Joseph Connors is represented in the report because the other two were so busy straightening the rest of us out that they did not do much writing; he is the author of Chapter 17 and gives toward the end of it a good sample of the case he made very forcefully throughout the project. Erwin Kim was the primary author of Chapters 25 and 26; he also participated in writing Chapter 11. Colin Bell was the primary author of Chapter 22 and also helped Helen Brownlee and me write Chapter 23 which is a cost analysis of a university budget; Helen Brownlee did most of the work of carrying out the cost analysis. Joseph McCloskey, recently Director of Research for the Association of Independent California Colleges and Universities, did a survey of innovations in private colleges and universities in California for us and reports on that in Chapter 24.

We also enjoyed extensive assistance of numerous distinguished reviewers who read and criticized all or parts of an early draft of the report; they are: Marvin Adelson, UCLA; Marvin Alkin, UCLA; Raymond Bauer, Harvard; Kenneth Boulding, Colorado; John Caffrey, American Council on Education; James Doi, University of Michigan; Paul Dressel, Michigan State; Henry Fagin, U.C. Irvine; Ralph Gerard, U.C. Irvine; Edmund Gordon, Columbia; Fredrick Kintzer, UCLA; Lewis B. Mayhew, Stanford; Nevitt Sanford, The Wright Institute; Richard Snyder, Ohio State; Ralph W. Tyler, Independent Consultant; O. Meredith Wilson, Center for Advanced Study in the Behavioral Sciences; Stephen Wright, College Entrance Examination Board. During the course of the project, U.C. Irvine lost Richard Snyder to Ohio State but he continued to be a tower of strength for us. Five U.C. Irvine students also served us well as readers and critics; they are: Debbie Brown, Archie Burch, Joseph Chaiken, James Heyne, Richard Siegel. Of course none of these persons can be assumed to endorse the report in any way; in fact, some of them were quite horrified at some of the things they found in this report.

Finally, not much would have gotten done without the know-how of PPRO's administrative expert, Judy Korte, and the patient support of our secretarial staff which included Jeanne Floyd all of the time, Dolores Pedroza most of the time, and Joan Greenlief, Ken Kukuda, Joyce Myers, Shirley Stibal, and Ann Wilson part of the time.

Alex Mood

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PART I
PERSPECTIVE

CHAPTER I - HIGHER EDUCATION IN TROUBLE

There is no doubt that higher education could use a little help. On the inside, students are trying to run universities themselves--aiming at prescribing curricula, grading themselves, hiring and firing professors, selecting the president, and investing the endowment. A few of them are rioting and burning and dynamiting. Some are outraging the hands that feed higher education by violating time-honored rules of conduct, by sneering at our economic system, by denouncing our military posture, by laughing at our moral system, by dwelling endlessly on the flaws in our social order, and by use of marijuana.

On the outside, trustees are firing administrators ever more frequently, legislatures are cutting back budgets ever more severely, donors are drying up, parents are demanding that campuses shape up or else, news media are industriously ferreting out (sometimes even creating) aberrant events on campuses and spreading news of them over the land, Birchers are howling for punishment, and police and government troops are killing and injuring students. Something is wrong with higher education; many things are wrong.

When we speak of higher education in this report we shall mainly use the term, as we believe most persons commonly use it, to refer quite generally and broadly to the activities of colleges and universities. We include all campus activities: teaching, research, cultural events, athletics, dormitory living, governance, as well as recent campus disorder generated by student dissatisfaction with higher education. We include the immediate geographical environments of campuses which, for most institutions, is a significant part of campus life. We include also the social and institutional context in which colleges and universities function: the attitudes of various segments of society toward colleges and universities, the legal and regulatory environment in which they operate, the modes of financing them, the various kinds of demand for educated persons and for certification of their levels of education, and the political ties that bind their fortunes to those of other institutions.

We do not include a great many other activities that might very reasonably be regarded as a part of higher education. For example, there are numerous enterprises which provide post-secondary education in the commercial world; the commercial telephone directory of any large city will list such opportunities for formal education as the following:

Typing, shorthand, filing
Office management
Driving
Automobile mechanics
Airline ground operations
Service Station operation
Modelling
Computer programming and operations
Medical and dental assistants
Contracting
Tailoring, knitting, sewing, weaving
Violin, piano, organ, guitar band instruments
Sales training
Flying
Jiu jitsu, judo, karate
Photography
Upholstery
Nursing
Bookkeeping, accounting
PBX operation
Foreign languages
Airline mechanics
Radio and TV repair
Laundry and dry cleaning equipment operation
Barber and beauty colleges
Welding
Real estate
Bar and restaurant operation
Drawing, painting, sketching
Ballroom dancing, ballet dancing
Crafts
Law
Diving, skin diving, deep sea diving
Embalming and undertaking
Stocks, bond, mortgages
Insurance

- Film and video program production
- Air conditioning and refrigeration
- Drafting
- Printing, bookbinding
- Teletype
- Acting
- Jewelry making
- Psychology, counseling
- Ministry
- Glazier
- Police, detective, investigation
- Memory training
- Merchandising, retail store management
- Acrobatics
- Chiropractic
- Interior decorating
- Speed reading
- Appliance repair
- Property management
- Radio and TV station operation
- Motel and hotel operation
- Heavy equipment operation (trucks bulldozers, cranes, etc.)
- Massage
- Public speaking
- Baking, cooking, catering, candy making
- Optometry, optician
- Bridge, chess
- Swimming, golf, archery, tennis horsemanship
- Machine tool operation
- Woodworking
- Lab technician
- Civil service exams
- Floral design
- Writing
- Property appraisal
- Surveying

We have taken the space to list all these simply to demonstrate that much activity is involved in this mode of education. Of course some of it hardly qualifies as post-secondary education but by and large it is geared to adults with high school preparation. How large this activity is seems to be quite unknown; no data on students or dollars can be found which will permit even a crude estimate to be made. Of course there are also very extensive informal opportunities for higher education to be found in museums, psychological and counseling clinics, libraries, bookstores, newspapers, churches, theaters, etc.

Very extensive post-secondary education takes place in the armed forces which have developed extremely effective educational programs for assisting members of the armed forces to climb career ladders.

Another large arena of postsecondary education exists in the business world in the form of on-the-job training. There is, of course, a great deal of implicit learning associated with almost any job as one moves up the employment ladder picking up new skills by practice and by observation of fellow workers. But there is also a substantial amount of formal education in such matters as salesmanship, merchandising, supervision, management, purchasing, operation of equipment, and the like. Some of it is highly specific to the products and processes of the company supplying the training, but most of it is largely transferable to other jobs and correctly identified as education.

We shall omit these commercial, military, and on-the-job kinds of education from our further consideration. The almost total lack of data about them makes them difficult to assess and perhaps, in any case, there may not be much potential in them for increasing effectiveness since they are largely satisfying immediate, explicit demand.

We are especially concerned in this study with efficiency in higher education. The impetus of the study came from the belief on the part of our sponsors and ourselves that there is a funding crisis in education which will be far more significant to the long run future of higher education than the campus unrest crisis which has received so much attention in the press during the past few years. The funding crisis has arisen because higher education has grown to demand an extremely large segment of the public budget for the simple reason that more and more youths are going to college. At the same time other demands on the public budget are also growing rapidly as a result of vastly increased public expectations for health and welfare services. We do not believe that higher education can compete as effectively in the future as it has in the past for public funds vis a vis these expectations. We believe that demands for new public services such as environmental control will further squeeze the higher education budget. It is the fundamental assumption of this report, then, that funds for higher education will not increase as rapidly as student enrollment will increase. As a result we expect that higher education will soon find itself forced to operate with fewer dollars per student and that society will soon face the prospect that the quality of higher education may decrease. We take it as given that quality will decrease if efficiency cannot be increased to offset the decrease in resources. In very brief terms, this study is concerned with exploring ways to increase the efficiency of higher education.

We endeavored to limit the exploration by deciding at the outset that we would not assess every idea for improving efficiency but would confine our attention to those ideas that had promise of producing very substantial increases in efficiency. We believe that we have not overlooked any such promising idea and take the position that, if we have not evaluated a given idea, then that idea would likely produce only minor increases in efficiency.

The financial crunch is the big trouble that higher education finds itself in but we shall also be concerned in this study with the other troubles having to do with campus unrest and with society's discontent with higher education. These troubles are all related and analysis of one of them can point the way to relieving another of them.

We tend, in this study, to put most of the blame for higher education's troubles on institutions of higher education themselves, some of it on society at large, and relatively little of it on students. Institutions of higher education have become sadly disconnected from society; they are doing things they should not be doing and they are not doing things that badly need doing; that is, they are misapplying their resources, and society, knowing something should be done but not sure what, is reducing those resources. That is perfectly understandable strategy in the circumstances and it will probably continue until society is convinced that higher education is carrying out its mission more in accord with society's expectations.

Great changes must take place in both education and in society if education is to serve society well. But education must take the lead and must go much more than halfway in making these changes because it is the creature of society and because it must bear most of the responsibility for having gotten out of touch with society's requirements as conceived by those who control the flow of resources to higher education.

How did this unhealthy state of affairs come about? Partly it seems to have been a natural consequence of the inertia of educational institutions. There was a time when colleges and universities dealt only with a small fraction of college age youth--the fraction often referred to as the elite together with some who aspired to join the elite and could obtain support for the expensive process of advanced study. The elite were supposed to be introduced to elegance and intellectualism; they were supposed to learn the classics; they were supposed to learn a couple of foreign languages; they were supposed to become connoisseurs of art, music, architecture and wine; they were supposed to become familiar with the literature of Western Europe as well as the history of the same region from Grecian time to the present; in short, they were supposed to become gentlemen of the old school.

This ancient image of the educated man still seems to make much sense to college professors and they still insist on a certain amount of this sort of acculturation. It makes less sense to society and it makes very little sense to undergraduates; even so, many students educated in this classical fashion will graduate and go out to become operators of gas stations, gatherers of juicy news, hucksters of cosmetics, and peddlers of fried chicken. Of course these occupations were chosen to emphasize the incongruity but would it have been a great deal less if we had chosen to name more essential occupations of a highly organized technological society: engineering, management, medicine, law, finance, chemistry, economics?

The fundamental contradiction is this: the conditions of our society tend to send increasing proportions of youths to college; colleges are desperately clinging to hoary ideas about what ought to be taught, ideas which are outmoded even for the elite and are hopelessly inappropriate for the multitude. Naturally the students are uninterested in much of this stuff and exercise great ingenuity to escape it. Naturally they are bored. Naturally they are raising some hell. Naturally they are poking around for skeletons in society's moral closet to rationalize the hell-raising. The hell-raising will stop when they become interested in their college work and it does not have to be terribly fascinating, just slightly interesting, just a little closer to what students would like to learn, just a bit more relevant to today's world and to what they expect to be doing after they leave college, just a trifle more flexible so that programs can be adapted to the preferences of the students that have enrolled in them.

Why has the curriculum been permitted to drift over the years to the point that tremendous numbers of students are alienated? We believe that it came about as a result of a fundamental defect in the organizational structure of universities; there is an inevitable conflict of interest between faculty and students which is adjudicated almost entirely by faculty alone. Being human, the faculty naturally settles these conflicts in its own favor. The conflict comes about over how faculty members spend their time. Students want them to devote most of their time to teaching, organizing relevant curricula, preparing excellent lectures, and patiently counseling students who need special help. Faculty members, by and large, prefer to spend their time doing research and publishing papers in order to increase the world's store of knowledge (and incidentally gain prestige in professional circles), writing books in order to transmit knowledge to the public (and incidentally to collect royalties), giving public lectures for the same reason (and incidentally collecting honoraria), serving as consulting experts to corporations and government agencies in order to keep one's teaching and research relevant (and incidentally to collect consulting fees), serving in advisory capacities to civic and legislative bodies in order to pay one's debt to society (and incidentally to enhance one's public image). If a faculty member puts his mind to it, it is not hard to justify short-changing students in order to engage in these rewarding activities; in fact one can sometimes persuade himself that he is not short-changing students at all but simply creating for future students a more capable and prestigious professor; that is, he will make it up later to other students.

Neither society nor higher education has come to grips with the public policy that is sending the majority to college. Certainly the policy makes sense from one point of view. The world is becoming more complicated, government is becoming more complicated. The simple business of living requires people to sign elaborate leases, undertake still more elaborate installment contracts, deal with experts whom they cannot evaluate but must employ to repair and maintain elaborate machinery, comprehend various risks and appraise insurance policies which ameliorate those risks in various ways and fail to do so in other ways described at length in legal terminology, understand the income tax laws sufficiently to stay out of jail, and so on. People really can't cope competently with the ordinary problems of daily living without some higher education. On the other hand, who is going to mop the floors, scrape up the dishes, unclog the toilets, and collect garbage? College graduates, naturally, if everybody is going to college. Some students have grasped this simple conclusion but higher education has not. Higher education gaily chases growth. It delights in booming enrollments, growing budgets, increasing staff, and building new campuses just like the old campuses. It behaves as every other mindless bureaucracy behaves--proliferating its activities, consolidating its authority, extending its domain at every opportunity with no thought of the consequences, having no doubt that whatever it does is good and good for everybody.

Having a program ill suited to the masses and yet having recruited the masses, there would seem to be two obvious options; change the program or reduce the clientele. We assume in this report that the latter option is not feasible. Our whole post World War II society has turned on the idea that practically everybody should go to college; higher education cannot very well turn it off. That would require that a line separating the elite from the ranks be drawn. Civilization has been hard at work erasing such lines for centuries; we are not likely to reverse that process. In the United States the line having to do with access to higher education has been virtually erased and we can be rather certain that the candidates for the ranks will not permit it to be redrawn. Thus we shall not consider the question of whether or not a good case could be made for doing so.

We assume, then, that in the not too distant future practically everybody will be going to college. (By *everybody* we mean the great majority of youths. Some responsible planners have suggested that the proportion may rise to 80% during the next decade.) If that is the case, then colleges must prepare people for every legitimate occupation--truckdriver, for example. That is not the easiest thing in the world to do. Which of our youth should be prepared for truck driving? What should they learn? What satisfactions are there in the career that can be enhanced by education to the extent that some people can be quite satisfied with it for some period of time? What time period are we thinking about? What are natural career ladders for truck drivers to follow when they leave truck driving? What other careers feed into these same career ladders? What kind of balance is there in these flows? What are the implications for counseling and curricula if there are imbalances? Higher education has a gigantic job on its hands preparing the youths of America for satisfying roles--all those youths that it helped lure into its halls with promises it would do just that--promises it made not only to students but to parents, legislators, congressmen, and taxpayers.

It should be reasonably clear that higher education is not going to make truck driving intellectually attractive. What higher education can do is prepare persons to lead interesting and effective lives whether or not they have to earn a living by driving a truck. A great many college educated persons today are finding themselves with no better option for a livelihood and in the future their number will increase. The meaning of their lives will therefore have to derive from other activities than their jobs. Their real careers may be in activities quite outside their jobs in such endeavors as politics, public service, arts, sports, education and so on. Higher education must, therefore, prepare them for such careers and must also see to it that they find it quite acceptable that their real concerns may not be related to their means of obtaining a livelihood. The matter of elitism and the association of certain jobs with the elite is explored further in Chapter 4. Throughout the report we use the word career to refer to one's primary endeavor in life; it may or may not be related to his job.

Many of our college students are already persuaded that elitism is doomed. They go about looking like bums but demanding to be treated with dignity and to be judged by their character--not their appearance. One of their several aims in adopting this appearance is to persuade society that people who cannot afford attractive clothes and people holding jobs that require them to get dirty must be treated with dignity and judged by their character--not by their appearance. These students may well be on the right track; if so, society and education have quite a long way to go to catch up with them. Education has quite a huge job ahead of it if it is going to bring society around to their point of view, if it is going to attempt to destroy status and privilege wherever they occur in society. It will have the opportunity to try if everybody is going to college.

Once we are persuaded that most youths will be flowing from high schools through higher education into adult life, we can begin to think rationally about financing higher education, about curricula, about selection processes, about how much higher education people need, about the higher education tracking system (universities, state colleges, community colleges), about certification (grades and degrees), about serving society, and about life styles. In these terms it will become easy to see why higher education is in trouble and hence easy to generate some alternative arrangements which have some promise of getting it out of trouble.

PLAN OF THIS STUDY

The study used a team of faculty members and graduate students to seek out and evaluate promising ideas for improving the efficiency of higher education. The search for ideas and for information about them was accomplished mainly by literature surveys but also by interviews and by carrying out a mail survey of all institutions of higher education.

Our general strategy was to organize the project work in three phases. In the first we would examine a host of ideas and changes that have been proposed for increasing efficiency and make a preliminary judgement about each as to whether or not it had real potential for bringing about a large increase. In the second phase we would embark on a thorough appraisal of the selected ideas by combing the literature and carrying out interviews with higher education administrators and with research workers in higher education. In the third phase we would attempt to amalgamate the most promising ideas into one or more self-consistent models of higher education which might be substantially more efficient than the one that exists now in the United States.

At the end of the first phase, eighteen possible changes for higher education had been selected for intensive examination; they were the following:

> Eliminate curricular material. This category refers to eliminating duplicated material, historical accretions of little current significance, and various cultural requirements that seem to have lost support, and to reducing the number of years required for certain kinds of professional training.
>
> Add new curricula. New curricula have been proposed to meet current urgent social need (increase relevance). They would relate to personal development, awareness, sensitivity, life style, personal value systems, communal living, community affairs, and problem-oriented courses dealing with critical social issues.
>
> Eliminate certification and grading. These are not educational activities; the burden of evaluation of students might be shifted to those agencies (business, government, graduate schools) that desire the evaluation.
>
> Reorganize students and faculty. Students could be given substantial teaching responsibility. (The best way to learn is to teach.)
>
> Increase hardware and self-instruction. Efficiency can be increased by teaching machines, computers, mechanized information systems, television, films, and the like.
>
> Fragment courses. This proposal contemplates that most courses would be very short (two to four weeks) and many would be mechanized. Computers can handle registration and scheduling problems that would arise. Object is to give a student wide opportunity to chart a personal path toward his chosen educational objectives (which path may differ considerably from the usual sequences open to him for obtaining a B.A.) and to enable him to omit those parts of present prerequisites that are not essential so that he can reach the objectives in minimal elapsed time if he wishes to do so.
>
> Promote consortia. Economize by persuading neighboring institutions not to offer all curricula with small demand but to split them up among each other. Include joint use of libraries, computers, expensive laboratories, etc.

Transfer training to other institutions. In business organizations and government agencies practical kinds of training might be done more effectively than institutions of higher education. Industries that enable and encourage people to grow might be given tax breaks.

Integrate education and work experience. Such integration is intended to better connect a person's education to his career and to encourage a pattern for continuing education which may reduce obsolescence.

Increase student participation in administration. Intended to increase orientation of college education toward the future and to improve student motivation.

Increase teaching rewards. Improve the teaching image relative to the research image and hence stimulate greater attention to the quality of teaching.

Channel a larger proportion of tax revenue into institutions via students. Would be done by tax supported scholarship and loan programs with the intent of increasing student influence on higher education as a counterforce to bureaucratic inertia.

Improve management. Application of management science, mechanized information systems, program budgeting and the like to increase efficiency of university operations.

Concentrate on learning tools. Minimize efforts to transfer factual information into the student's head. The intent is to transform the student as rapidly as possible into his own teacher.

Match students better with colleges. Reduce apathy, disorientation and number of dropouts by better guidance and channeling methods.

Increase student body. Enroll more students and retain longer those that do enroll. Intended to increase efficiency under the assumption that marginal cost will be smaller than average cost.

Set up campus student information systems. Information would generally help students get ahead of the system by supplying them with accurate appraisals of each faculty member and each course as well as the practices of departments and officials. Intended to help weed out weak courses and weak staff members.

Introduce classroom without walls. Offer most freshmen and many higher level courses over a nationwide TV network and give credit by examination.

Some of these fell by the wayside as they began to look less promising on closer examination or as very little definitive evidence could be found for appraising them; others were combined. The final outcome of our consideration of them appears in Part III.

The greatest deviation from the original plan of the study was steady abandonment of quantification and ever more reliance on judgment. In the beginning we had high hopes of bringing together data which would support and perhaps even give crude estimates of increases in efficiency that might result from certain changes in higher education. Also in the beginning some of us had a distinct dollar and cents orientation, an idea that higher education might usefully be examined as a production process (despite the obvious limitations of that view of its function), an inclination to try to look at the efficiency of the institutions in somewhat the way that boards of directors look at the efficiency of corporations. We drifted farther and farther from this posture and finally gave it up altogether; partly that occurred because useful data were very scarce but mostly we did so because we became convinced that the real opportunities for increased efficiency lay in quite radical rearrangements of higher education for which it would be hopeless to find data in any case. We shall explore in Chapter 3 the complications of specifying what comprises efficiency, at which time it will become much clearer why we were forced to give up any idea of actually calculating efficiencies.

The report itself, in the six brief chapters of Part I, lays out some background information about the study, something of the context we adopted for the study in the sense of limitations and of underlying assumptions, our major recommendations, and some thoughts about tactics that might help achieve some of the recommendations. We cannot claim that the body of the report supports the recommendations very well although it does to some degree; primarily, though, the recommendations are simply our judgments of what needs to be done after struggling mentally with that problem for a year and a half. One thing we can vouch for, the study did make a difference in our thinking. Not by any stretch of the imagination would we have put down that set of recommendations in the early days of the study. As we dug deeper and deeper into what higher education was doing and not doing, why students were attending and yet were alienated, and what society's rationale was for supporting higher education, we came to believe that its role in society must be changed radically. The general tenor of the recommendations is to advocate spreading the efforts of institutions of higher education over a much larger segment of the population and a much wider range of human endeavors, but they contemplate that no more resources will be required because technology can make higher education more efficient and because we advocate that the average amount of higher education per person be reduced and scattered through their careers.

Part II of the report presents six abbreviated models of higher education that were produced by the staff in an effort to devise systems of higher education that might be improvements over the present system. The original purpose of undertaking construction of the models was to take account of the inter-actions between promising innovations and changes.

There are six of these models and they make no pretense of being mutually consistent; they are simply directed to improving higher education along different paths and assume that we shall need in the future an even greater variety than we have now. One of them is a slightly modified and idealized library; one describes a university especially designed to serve the urban complex; another explores the ways in which modern electronic technology might contribute to learning; another simply explores the consequences of attaching a different administrative philosophy to existing institutions; another explores the use of institutions other than colleges and universities for learning; another combines some of these ideas and attempts a crude calculation of how much they might increase effectiveness of higher education.

Part III presents the results of our examination of the eighteen changes we selected as having real potential for improving the effectiveness of higher education. The primary method of appraisal was to make an extensive literature search, but we also interviewed a number of research workers and a number of university officials in order to get first hand impressions of promising experiments and research. We also carried out a mail survey of all institutions of higher education to investigate management effectiveness and to seek out innovations. In addition we did an interview survey of private colleges in California to take out insurance against the possibility that the literature survey and mail survey might overlook innovative ideas that were being thought about but had not yet appeared in print or in practice. We also carried out a brief cost analysis of the operations of one university in order to see whether any clues could be found there that might lead to ideas for more efficient operation.

PHILOSOPHY UNDERLYING THE STUDY

During the course of the study there was developed a somewhat fragmentary philosophy of higher education and its role in society. It came about unintentionally and was largely unrecognized until the end of the project. It was, to some extent, forced to develop by several circumstances surrounding the study. One of them was the presence on the team of three young persons who were quite dissatisfied with higher education's role in maintaining the status quo and who were continually raising questions about the social ineffiency of higher education resulting from what they believed to be its inhibition of social adaptation. Another, partly arising out of the first, was the greatly extended notion of efficiency that developed as we kept rejecting simpler ideas of efficiency as misleading. We thus pushed ourselves back to fundamentals--back to "What is the purpose of it all anyway?" A third circumstance was the lack of existing information or our inability to develop needed information on the basis of which decisions could be made about proposed changes in higher education. We were therefore constrained to make many decisions subjectively and the aggregate of such decisions revealed at least a partial underlying consistency which we shall describe here. It is basically an egalitarian, student-oriented philosophy. We hope it will help the reader see a little more unity than might otherwise be apparent in the report.

We, and others, have observed that there is rampant discrimination in the job market against people who have lesser amounts of education. The discrimination is bolstered by the obvious fact that educated persons tend to perform better than uneducated persons. But there is altogether too rigid a failure to make allowance for exceptional persons who through ability and experience can perform well; they are denied access to positions they can easily fill purely on grounds that they have insufficient education. On the other hand, persons with a college degree and little ability find wide access to higher status entries into employment. The net result is that persons who can afford the cost of a college education can purchase, so to speak, desirable positions in the employment ladder which are barred to persons who cannot afford a college education. We believe that this basic injustice generates destructive tensions in our society which can only become more serious as awareness of it grows. The injustice was greatly magnified during the past few years by the fact that the same privilege enabled one to purchase also four years of draft deferment. It is one fundamental tenet of our philosophy that access to higher education must not rest on financial qualification.

It is another fundamental tenet that access to higher education should not rest on intellectual qualification as usually determined by high school performance and scores on entrance examinations. The reason is that underprivileged segments of society are distinctly handicapped by these criteria. The public school system is thoroughly dominated by middle and upper class cultures which inevitably put working class cultures and most minority cultures at the foot of the educational ladder. It is done innnocently, for the most part, without malice or intent, but it is done. The underprivileged are subtly channeled away from higher education and into less desirable occupations.

As a matter of simple justice, we believe that these channeling procedures and the advantages of wealth must no longer control access to higher education. We submit that the sole criterion for access must be motivation. Anyone who desires higher education should get it freely and easily. Outcomes for most young people may not change a great deal; the wealthy and the culturally privileged will certainly have definite advantages in any case. But the underprivileged must be given a much better chance than they now have to escape their underprivileged status. Society will benefit, as it has in the past, by the upward mobility of able persons who will be prepared to serve society more effectively, but, more importantly, society will benefit by removing a cancerous source of frustrations from itself.

We believe that it is an extremely distorted preparation of young people to inflict sixteen years of continuous formal education upon them. The requirement of a college degree for entry into the higher status occupations ensures that youth will be scandalously overexposed to one social institution and scandalously underexposed to all other institutions of society that they must live with for the rest of their lives. That is obviously not balanced education. Youths, even in grade school, and surely in high school must regularly participate in the world of work and perform public service; in doing so they should rotate through a great variety of jobs and social tasks in order to obtain wide first-hand experience with the society in which they live. To immediately pile four more years of exposure to formal education on top of high school is patently absurd to most college students; the military draft and the normal conditions of employment, however, make it difficult for them to do anything more sensible.

We believe that individuals are unique and must have unique educational experiences in the choice of which they have the final say. We shall not speculate about how soon a child should have a significant voice in his own curriculum; excellent authorities can be found who will declare that kindergarten is not too early. We have no doubt whatsoever that a person of college age can make these decisions for himself better than anyone else. He could make still better decisions if his experience had not been narrowly confined to educational institutions alone. He would probably insist on it if he had some outside experience; as it is, he knows about the outside only by hearsay and hence has little basis for challenging the declarations of education about what he should learn. His education is, as a result, not well designed to suit his particular talents and interests. We strongly support extensive counseling and the provision of students with comprehensive information about the pros and cons of various courses of action, but they must make the final decisions about curricula and courses regardless of breadth requirements, grade point averages, and prerequisites. Especially, they must have a large say in the decision about where they will go to college. They must not be constrained by tracking systems and by out-of-state tuition. We believe that access to higher education must be controlled by a nationwide policy and procedure which makes the full range of the nation's higher education resources available to individuals on the basis of their own voluntary decisions.

We believe that the educational system tends to impair self-confidence, to reward docility and conformity, and to penalize courage and scepticism. These unfortunate effects particularly apply to students from the underprivileged segments of society. The result is that some of the most promising social innovators are channeled away from higher education and society is denied its best resources for adapting to the future. By the same token, the tracking system found in many states which sends nothing but grade-getters to universities seriously cuts back the potential effectiveness of universities for serving society.

We believe that the world is changing ever more rapidly and hence that career obsolescence is certain to become an increasingly serious problem. As a corollary we believe that concentrated formal education must give way to intermittent continuing education and hence that higher education must be made easily available to persons of all ages.

We believe that materialism is waning -- that Americans have seen enough of materialism to be convinced that the meaning of life is definitely not to be found in that doctrine. As a corollary we believe that high income will cease to be the prime mover of individuals. Not only is high income likely to be pursued with much less dedication than it has in the past, but further than that, we believe earning of income may become quite secondary to other endeavors for many individuals.

We believe that informal education via TV, radio, books, newspapers, and magazines will tend to substitute for parts of higher education and hence tend to preempt some of higher education's roles.

Finally we believe that as individuals become better educated they will insist on having a larger voice in decisions that affect their lives. There will be more confrontations, more challenges of vested interests, more disgust with the conflicts of interest that arise when due process is in the hands of those who benefit by the preservation of their privileges, more development of ways to circumvent suppresive due process, and more acceptance of these other ways in the interest of equity.

CHAPTER 2

TASKS OF HIGHER EDUCATION

Anyone who suggests a way to improve the efficiency of higher education must know, or presume to know, the goals--or tasks--of higher education.* We surely can't discover how to accomplish the goals of higher education more efficiently if we don't know what these goals are. But what are they?

Educational goals are much like national goals: no two persons are apt to see them the same way--and no one person is apt to see them clearly and definitively. In other words we have two problems with most definitions of educational goals. They are usually vague and they are always subject to legitimate dispute. Perhaps with a little effort we could all be less vague in discussing goals but there is no way we can resolve all disagreements about them. People have different interests, different needs, different values, different hopes, different aspirations. Consequently they will endorse different goals for our educational system--and not only different goals but often conflicting goals. It will never be otherwise.

How then can we proceed to improve the efficiency of an enterprise if we can't define its goals? The answer is that we can't--at least not in any indisputable sense. But for any assumed set of goals, or tasks, there are corresponding opportunities to improve efficiency.

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*We use the words "goal" and "task" more or less interchangeably, prefering the word "goal" when we want to emphasize ultimate objectives, and the word "task" when we want to speak of more readily describable proximate objectives.

Some assumed tasks of higher education are outlined below. They have guided our search and, like all guides, they have directed our attention away from many things as well as toward things. We make no great claims for this list of tasks, and we acknowledge that the list has these characteristics:

- The list may include tasks which faculties and administrators and alumni and taxpayers think our colleges perform, but which in fact they do not perform.

- The list may include tasks which would be commonly disavowed as proper functions of our colleges but which, nonetheless, are in fact performed by them.

- The list doubtless includes tasks which are approved by some people and disapproved by others.

- The list is incomplete.

- The list is descriptive, not normative. We are attempting here to list tasks that actually are endorsed or achieved or both. We are not attempting to outline the "proper" tasks of our colleges.

Task 1. Sorting and Labeling People

We repeat: we are listing actual tasks, whether or not we consider them "proper" tasks. Much, very much, of what our colleges do is related to sorting people into different categories and labeling them accordingly. We sort out those who are permitted to enter college from those who are not, and those who will be labeled "graduates" from those who will be labeled "drop-outs" or "failures."* We sort out those who will become engineers from those who will become physicists, and those who will attend prestigious colleges from those who will not, and those who will be subsidized from those who must earn their tuition, and those who will teach others in our schools and colleges from those who will not teach, and so on and on and on.

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*Joseph Chaiken points out that higher education is also at considerable pains to promote the legitimacy of the sorting process and the ritualistic glorification of the degree; thus it buttresses the ascendency and elitism of those who can afford a college education.

Task 2. Advancing the State of the Arts and Sciences

Most of the progress civilization has made since its birth has been due, not to the efficiency with which it utilizes manpower and talent and resources from day to day, but rather to the persistent advances made over time in skills and technology and understanding. The quality of life of future generations will continue to depend very much upon the rate of advance of the arts and sciences. Promoting this cause is one of the functions of colleges and universities.

Task 3. Coping with Social Problems

Not without encouragement from professors of all disciplines, the general public has come to look upon our college faculties as a source of knowledge--and perhaps even a source of wisdom. Since the public is confronted with a host of difficult problems, ranging from war to racism to pollution to rebellion, it is inevitable that they turn to this source of expertise for help. Our colleges may feel neither comfortable nor capable with this assignment but they cannot gracefully escape the task altogether.

Task 4. Training

We need accountants, dentists, history teachers, nurses, etc. We also need to train "citizens," perhaps. There is wide disagreement about what kind of "citizens" our colleges should train but there is little doubt that enculturation of some kind is a significant part of college education.

Task 5. Providing a Miscellany of Services to Students and Society

There are numerous supportive services which are, intentionally or unintentionally, well or poorly, provided by colleges. Colleges provide a rationale for young people to continue receiving financial support from families even after they have left home. Colleges provide a prolonged and varied opportunity for young people to find spouses. They provide a custodial service appreciated by both parents and society-- the latter particularly because a large number of youths are held off the labor market. Colleges permit students to discover and experience different types of people, varied cultures, new philosophies. Colleges help students to develop self-confidence (and sometimes they destroy that confidence) and to acquire savoir faire, and to learn etiquette, and to become sophisticated, and to gain facility in the use of multi-syllable and mono-syllable words, and to communicate and interact with people, and to sample various experiences and forms of self-expression, etc. There is no point in denying this general service function of our colleges. For many students, and for many parents who send their children to college, this is mainly what it's all about. The classroom activities are a secondary matter. There is also no point in denying that there is little agreement about the appropriate nature of these services and the appropriate institutional setting in which to provide them.

Task 6. Educating

We do not mean, by listing this task last, that it is least. Nor do we mean that this task is necessarily distinct from the preceding ones. We think of an educated person as one who has acquired a broad and varied, though of course not universal, fund of knowledge, and as one who has developed considerable ability and inclination to perceive and to question and to feel and to invent and to acquire information and to analyze it with honesty and care. We also think of an educated person as one who has acquired some wisdom.

These are some of the tasks commonly performed by, or proposed for, our colleges and universities. There are several things we should keep in mind as we consider possibilities for accomplishing these tasks more efficiently.

First, it is almost ridiculously easy to discover ways to accomplish any one or two of these tasks more "efficiently" if we permit ourselves to forsake the other tasks. It is often very easy, too, to accomplish tasks more "efficiently" simply by increasing or reducing the scale of operations--by admitting more or fewer students, for example. We place the term "efficiently" in quotation marks because it is often interpreted in careless or shallow ways--as we have just exemplified. We shall discuss the concept of "efficiency" with greater care in the following chapter.

Second, we should remain aware that the tasks of "higher education" are not necessarily synonymous with the tasks of colleges and universities. Libraries, newspapers, commercial schools, on-the-job-training, work, life-long-learning programs, group therapy, "free universities," television, clubs of many types, extension courses, marriage, etc., can all contribute along with colleges toward accomplishment of the tasks outlined. An important question of efficiency is that of how to allocate these tasks among the many alternative contributors.

There are multiple approaches to the challenge of multiple tasks. One approach is to make colleges and universities into "cafeterias," each providing a wide variety of services according to the tastes and means of their various customers--i.e., their students, faculty members, alumni, government and private donors, etc. Another approach is to let the various colleges specialize. A third approach is to let colleges serve some of the tasks and, as we have suggested, let other institutions serve the remainder. A fourth approach would be to neglect some of the tasks.

We wish to reemphasize that our listing of tasks is meant to be descriptive rather than normative, although it may be more descriptive of intentions than of actual achievements. We do not, for example, believe that sorting and labeling people is necessarily an important need that our colleges should aspire to satisfy. We do believe, however, that colleges actually perform this function and that, consequently, we should consider the efficiency with which the task is accomplished. So also with the other tasks listed.

We must emphasize one other point before proceeding. The decision about which tasks our colleges should perform and the decision about which people should be accepted and supported as students are not independent decisions. If we decided, for instance, that the primary function of our colleges was to provide group therapy, or to provide outlets for free expression, or to provide an escape from the narrow confines of the home environment, then it certainly wouldn't follow that the opportunity to attend college should be granted on the basis of high school grades. We might be excluding from attendance the young people who needed or deserved the opportunity most. For that matter, it might be the middle-aged or the elderly who need such opportunities! Conversely, if we decide that everyone, or almost everyone, is going to college, then the tasks performed by our colleges must be considerably expanded and diversified to serve this expanded clientele.

CHAPTER 3

EFFICIENCY AND CHANGE IN HIGHER EDUCATION

People mean different things by "efficiency." It is often interpreted in narrow or shallow or awkward ways. For example, some people might suggest that we define efficiency in higher education as the ratio of degrees awarded to dollars spent, or the ratio of students enrolled to square feet of classroom space, or any of a thousand other such simple ratios. People respond to such narrow concepts of efficiency in several different ways:

- Some people take them seriously.
- Some people react by asserting that efficiency is only a secondary concern if indeed it is of any importance whatever.
- Some people suggest that any such ratio is, at very best, only a hazardous and grossly over-simplified indicator, rather than a measure, of efficiency and, at worst, a complete misinterpretation of an important concept.

When efficiency is given some shallow interpretation, as it often is, we are as loath as anyone to give it serious concern. On the other hand, we believe that efficiency, like education, is extremely important, no matter how often these concepts are perceived or interpreted in ridiculously shallow ways. Interpreted well, efficiency means nothing less--and nothing more--than maximum achievement, given the goals to which we aspire and given the resources available.

We have already noted that people will disagree about the goals of higher education. It follows that people will disagree about efficiency, for the term has no significant meaning whatever independent of assumed goals. To be "efficient" while neglecting important goals is like flying without getting off the ground or like compressing a vacuum. It is as easy as it is meaningless.

We must also be mindful that even a single individual will have multiple goals, rather than a single goal, and hence the idea of "maximizing achievement" is not so simple as it sounds. Each goal has to be weighed against the other goals, since it is almost inevitable that we can't "maximize" each of them simultaneously. The pursuit of any one goal is likely to entail some sacrifice of other goals. The notion of "maximizing achievement" can only be given specific meaning by agreeing upon the relative importance of the various goals--or, somewhat more precisely, by agreeing upon relative weights to be assigned to incremental advancements toward the various goals. Actually, since there are likely to be interdependencies among the goals, the problem is more complicated than this.

There are at least four conceptually distinguishable ways in which higher education might be changed, or might be changing. The relationship of each of these varied types of change to the notion of efficiency is somewhat different. The four types may be characterized as follows:

Type 1 change: any change in the essential nature of the tasks performed by higher education.

Type 2 change: any change in the scope or mix of effort of higher education. (For example, by increasing the number of students or the size of colleges, or by expanding or contracting the amount of basic research, or by changing the proportions of graduate and undergraduate education or the proportion of professional to scientific education or the percentage of minority students in the student body.)

Type 3 change: any change in the teaching or learning techniques of higher education (for example, by extending the use of computers or television, or by introducing the use of drugs in a controlled and purposive way, or by rediscovering effective lecture techniques, or by varying the form and frequency of examinations, or by improved research methodology.)

Type 4 change: any change in the aggregate organizational system of higher education (for example, by changing the forms of governance of colleges, or by organizing consortia and encouraging greater specialization of colleges, or by altering the incentive structures affecting faculties or students, or by improving information channels.)*

As we mentioned, there is a somewhat different relationship between each of these types of change and the notion of efficiency. Consider the first type of change: a change in the essential nature of the tasks performed. Surely we could make no greater contribution to the cause of efficiency in higher education than by utilizing our educational means for the right educational ends, rather than for the wrong ones! No one can dispute this. This type of change offers the paramount hope for truly significant improvements in educational efficiency--but this type of change is least amenable to strict objective analysis. No matter how much data we collect, no matter how much sophisticated analysis we perform, no matter how much ingenious empirical research we undertake, we will not be able to offer demonstrable proof that any one particular set of educational ends is the "right" set. We are dealing here with the most difficult of all questions: the question of basic values, of basic goals in life, both personal goals and national goals. No report or analysis or recommendation concerning efficiency of higher education can avoid confronting fundamental issues about the appropriate tasks or goals of higher education--on the other hand, no report or analysis is going to be able to resolve these issues.

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* Kenneth Boulding's comments on this chapter suggested that a fifth type might be added: changes in the environment of higher education, particularly in competing learning institutions. This type might also include changes in the evolutionary environment--changes in the things that determine the survival of different goals or institutions. In a similar vein, Lewis B. Mayhew suggested that changing the method of financing higher education could have profound effects, and that the frequently heard proposal that financing be shifted from the older to the younger generation needs a thoroughly probing analysis.

In order to reduce the risk of misinterpretation, and to give due emphasis to the problem, let us make the following summary statements about changes of this first type:

- Suggested changes of this type are certain to be judgmental and controversial: they reflect value choices more than they reflect factual observations; they will hinge on political processes more than on analytical processes.
- However, such changes, or suggested changes, cannot be simply ignored on that account. On the contrary, they are the most important changes wanting attention.
- Although typical forms of objective analysis will be inadequate to resolve the issues, we are not implying that analysis may be dispensed with while we resolve these issues by the seat of our pants. We are simply admitting that these issues demand the broadest guage of analysis of which men are capable: an analysis that distills, through ceaseless dialogue, whatever wisdom can be wrung from history, philosophy, the arts and sciences, and the experiences and judgments of us all.

The second type of change, a change in the scope or mix of educational effort, has a special relation to efficiency. Changes of this type are perhaps second in importance only to the preceding type discussed. But we must be aware that it is deceptively easy to improve "efficiency," as this concept is too often defined, by changing the scope of activity. If we double the number of freshmen admitted to college, or if we reduce the number by half, there is likely to be a marked change in any typical measure or indicator of "efficiency." Consider such simple ratios, or "efficiency" indicators, as number-of-students-per-faculty-member, or students-per-dollar-expended, or students-graduated-per-student-entered, or degrees-granted-per-dollar-invested, and so on. Any of these indicators could easily be affected, in any desired direction, by altering the scope of activity. They could also be affected easily, in any desired direction, by altering the mix of activity: by expanding one college department and contracting another, for instance. The quest for greater efficiency in higher education can quickly become a futile, self-deceiving game if we allow ourselves to combine overly simple concepts of efficiency with options to adjust the scope or mix of educational pursuits. Again, let us try to emphasize the point and avoid misinterpretation:

- Changes in the scope or mix of educational efforts are among the most important changes needing attention.
- Changes in scope or mix should not be motivated or guided by desires to maximize any of the typical crop of simplistic indicators of efficiency. Such changes can only be evaluated sensibly against very basic, comprehensive, multi-dimensional definitions of efficiency.
- No matter how ingeniously we define "efficiency," no matter how comprehensive are the values or aspirations that we incorporate into the definition, it will remain true that different groups of people will be differently affected, for better and for worse, by any changes in the scope or mix of educational effort. In other words, such changes involve inevitable conflicts of interest that no analysis of "efficiency," however broadly defined, can fully resolve; their resolution, therefore, must lie primarily in the political domain.

The third type of change, change in teaching or learning techniques, is the type of change to which the concept of efficiency is most easily applied. We can analyze the effects of changes in techniques while keeping the essential nature of educational tasks and the scope and mix of educational efforts fixed. Changes of this type can often be tested and appraised in situations with very limited boundaries--a single classroom, for instance, or a single course--and such changes are not so inextricably linked to those unresolved issues of values and goals that confound efforts at objective appraisal of the first two types of changes mentioned.

The fourth type of change concerns the aggregate organizational system of higher education: changes in forms of governance, or lines of communication, or organizational patterns, or geographic distribution of educational institutions, or procedures for distributing financial aid, or incentive structures, etc. The concept of efficiency could be more or less easily applied to such changes except for one complicating circumstance. Changes of this type are very often compounded with changes of the first and second type. If we can study changes in the organizational system while holding constant the basic tasks of higher education, and while keeping the scope and mix of effort unchanged, we can develop some objective estimates of their impact on efficiency, variously defined. Where such changes result from, or lead to, changes in tasks or in scope or mix, then we face all the difficulties already noted in applying the concept of efficiency to these other types of change.

There are several reasons for presenting this brief review of the relationship between various types of educational change and efficiency. One reason is to discourage the common temptation to oversimplify the notion of efficiency: a temptation that leads to one or the other of two alternative consequences, either of them unfortunate. Either we accept the oversimplified notions of efficiency and are misguided by them, or else we perceive their limitations and dismiss all attention to efficiency as a narrow-minded and inappropriate concern. Another reason for the review is to discourage futile expectations for conclusive objective determination of all questions of efficiency. Efficiency has no substantial meaning independent of goals, and it follows that we cannot be any more conclusive or objective about basic issues of efficiency than we can about goals themselves. A third reason is to discourage an almost inevitable tendency for analytic studies of higher education to focus attention on the lesser, rather than on the greater, issues of efficiency. Since we all esteem objectivity and hard data and empirical research and statistical analysis, it is tempting for us to concentrate our attention on those types of change, such as the third type, in which it is easiest for us to be objective, empirical, etc. But the other types of changes may be far more important even if they cannot, by their very nature, be analyzed with conclusive objectivity. (Meredith Wilson observes that this is a very common failure of master planning in which some "masters" plan on the basis of relatively secondary criteria and thus tend to foreclose critical thought about the major premises.)

What we are saying is that there is much temptation to analyze efficiency in the small while neglecting it in the large--simply because that is the easier task. The remainder of this section is an effort to clarify and emphasize this assertion.

Studies of efficiency in higher education often concern themselves with building costs and the utilization of classroom space, and these are important concerns. But bricks and mortar, although they happen to be relatively easy to measure and to put a price tag on, are not the major resources utilized in our educational processes. We should certainly be as concerned about the efficiency with which we allocate and utilize human resources as we are about physical resources. There are many, many ways to be inefficient in allocating human resources, such as the following categorization suggests.

Inefficiencies in Allocating Human Resources

1. Errors of exclusion and inclusion.

Until that sensible day arrives when almost everyone is a life-long part-time student and hardly anyone is ever a full-time student (i.e., until that day when both life-long learning and life-long earning have become the warp and the woof of the fabric of social existence) the artificial boundary line between participants and non-participants in higher education will remain absurdly important. Consequently, until that sensible day, a major form of inefficiency in higher education will be errors of exclusion or inclusion in the system.

1.a. Errors of inclusion.

Four types of inclusion errors need to be distinguished.

- Inappropriate inclusion of people sufficiently talented and motivated so that their personal development and social contribution could be better served without full time confinement to an institution. This type of error will increase as we improve the quality of lower education; it will decrease as we improve the quality of higher education; and it will increase or decrease depending upon whether or not the public fascination with college degrees continues or subsides.

- Inappropriate inclusion of people whose interests and talents and self-confidence have been sufficiently suppressed by our lower education institutions so that their personal development will only be further delayed, and their self-confidence further violated, by full-time commitment. Current trends are mixed in their impact on this form of inappropriate inclusion. It might be supposed that improved quality of lower education would improve the situation, but it probably won't. So long as higher education remains an automatic sorting device for distributing the better employment opportunities, any general improvement in calibre of the student body will simply mean either a tighter academic race or else a longer one--stretching the race out into graduate school. Other trends are likely to assure that the magnitude of this error increases. For example, the increasing variety of college curricula and the availiability of counseling makes it ever more difficult to predict potentiality for academic success, and the increasing availability of financial support will prompt more people to make the gamble.

- The third type of inclusion error is only a special case of the preceding types but it is sufficiently important to deserve separate emphasis--inclusion of people beyond the optimal length of their college program. Errors of this type are generated by the all-or-none character of the payoff (a degree) combined with the ironically tradition-bound and imitative character of academic programs ("four years" must be written on stone tablets). The Academy glorifies scholarship over superstition, but how much scholarly analysis is exerted to appraise the costs and benefits of language requirements, credit requirements, dissertation requirements, residence requirements, etc.? Folklore and superstition and hallowed tradition are as rampant in the Academy as they are in Politics and the Church.

- The fourth type of inclusion error concerns faculty--all those faculty members who ought, occasionally at least, to be blessed with experiences outside the academic environment and also those for whom some other career would be optimal.

1.b Errors of exclusion.

The collection of people who should be, but are not, participants in the higher education establishment cannot be readily counted until we distinguish different sub-groups of the collection.

- Inappropriate exclusion of people because of financial constraints.
- Inappropriate exclusion of people because of their lack of information about colleges and careers and benefits of college attendance.
- Inappropriate exclusion of people because of: (a) handicaps due to educational or cultural background, and (b) inade-

quacy of remedial facilities. This sub-group, particularly, needs to be sorted along a continuum indicating the extent of the handicap and the difficulty of remedial action.

- Inappropriate exclusion of people due to the absence, or inadequate quality, of appropriate educational programs.
- Inappropriate exclusion of people who could contribute as faculty members, full-time, part-time, or occasionally--paid or volunteer.

2. Mismatch errors.

Given the people included and excluded from higher education, there still remains abundant opportunity to improve the efficiency of higher education by better matching of people with programs. Some distinguishable sub-categories follow:

2.a. Homogenous disciplines and professions.

Any higher education system which matches students with diciplines or professions in such a way that homogeneity results is, probably, retarding progress of these disciplines and professions. Since contributing to such progress is a tremendously important function of higher education, and since small differences in the rate of progress lead to considerable differences in absolute magnitudes within a few years, this form of inefficiency in higher education cannot be dismissed lightly.

2.b. Imbalance of talent or numbers.

Among the more serious forms of inefficiency in higher education must be listed sub-optimal allocations of talent among the various disciplines and professions. If we develop too many physicists or engineers or English teachers and too few medical researchers or mathematics teachers, then our use of talent is inefficient--and the efficiency is far more important than under-utilization of classroom space or excessive expenditure on landscaping. Also, if all of our best talent goes into engineering and only modest talent goes into social studies, or vice versa, again we are being inefficient in a very serious sense.

2.c. Individual errors.

- Even if talent is allocated appropriately in the aggregate, there is little reason to assume that sub-optimal matching of individuals to disciplines or professions is uncommon.
- In addition to matching students with disciplines or professions, there is the challenge of matching students to schools in an optimal fashion.
- It is difficult to perceive in the current higher education system any reason to suppose that faculty are allocated among schools in an efficient fashion. Has this important question ever been examined?

3. Post-education errors.

Since the higher education system plays a large role in our evaluating, accrediting, and ranking procedures, inefficient use of talent after graduation or withdrawal from college is partly a responsibility of our higher education system. We have little reason for presuming anything other than frequent and grievious errors in the ranking and assessment process with consequent high costs to individuals and society alike. This is surely a major form of inefficiency of higher education. The misinformation and misguidance generated by the system misleads both students and their prospective employers or professional associations alike. The self-fulfilling quality of erroneous assessments blinds us to the gross inefficiency of the system.

So much for an example of an aspect of efficiency which is extremely important--and extremely difficult to analyze objectively. Consequently it is receiving much less analytic attention than it deserves. We could have used other examples, for instance:

Inefficiencies in Research

Higher education is supposed to advance, as well as transmit knowledge and wisdom. But are we concentrating on the appropriate research problems? Are we employing efficient research processes? Have we devised efficient organizational structures for promoting research? Have we constructed appropriate incentives to motivate and guide research activity? Are we keeping a healthy balance between progress in the various scientific and technological fields of learning? These are exceedingly difficult questions to answer, but they are questions of transcendent importance. The efficiency with which we advance humanity's store of understanding is a principal component of the efficiency of higher education.

Consider another example:

Inefficiencies in Aggregate Organizational Structure

We listed, earlier, changes in aggregate organizational structure as one of four basic types of change in higher education. No matter how efficient individual organizational components may be, the total system could be grossly inefficient! Do we have the right mix, nationally and locally, of different types of institutions and programs and departments? Does the variety and the proportion of the total system reflect well the variety of student goals and backgrounds or the variety of society's needs? The individual components of the system are governed, somehow or other, but there is no obvious governance of the total system--and there is little reason to believe that some "invisible hand" is promoting an efficient overall design.

There are other important foci around which studies of efficiency in higher education should concentrate. Inefficiencies in the allocation of time deserve attention. Few things are more valuable than time and few things are more often neglected. A year in any person's life is a precious and nonrecoverable asset. Our higher education system freely--or, rather, peremptorily--assumes the awesome responsibility of guiding the allocation of time of students. The negligence and self-satisfaction with which this responsibility is fulfilled does not guarantee that it is done well. The matter of efficiency in higher education is, in large part, a matter of the efficiency of the decision-making structures and the incentive systems guiding the allocation of time.

Our intention in these comments, as we said, is to encourage a broader concept of efficiency than one which focuses only on such visible, countable things as classrooms, credits, computer consoles, degrees, etc. Our intention is not, however, to deny the importance of these things, and it is certainly not to diminish the importance of efforts to study and promote improvements in the efficiency of teaching and learning techniques. The sight of a professor lecturing to a room full of students frantically taking notes is not, perhaps, as anachronistic as the sight of a horse-drawn ice wagon on the streets of New York, but the sight does not epitomize efficiency either. Such matters as this deserve very serious attention, but it would be a mistake to let them divert any significant amount of attention from matters that are much more crucial to the efficiency of higher education.

CHAPTER 4

EDUCATION, LIFE STYLE, AND ELITE CAREERS

Trouble in higher education is nothing new. A very short history of American higher education provided in Chapter 15 of this report makes it quite clear that its normal state has been one of being in trouble from the time it all began with Harvard College in 1636. America has normally had its doubts about higher education, has normally been mistrustful of intellectuals, has normally been scandalized by student behavior, has normally regarded professors as nincompoops who do not know how to cope with the real world, and has normally believed that many faculty members sneer at and undermine American ideals. Attitudes today toward higher education are not the least abnormal; the abnormal periods were those few brief moments when higher education enjoyed a substantial measure of public support. They came when America believed it was in serious distress and was desperate enough to turn even to professors to try to find a way out of distress. Such a moment came, for example, when the Soviet Union launched its first Sputnik. That was less than fifteen years ago and began the greatest surge of public support that education has ever received. Sputnik was a scientific threat of mystifying proportions and the nation was convinced that the only way to counter it was by developing American science precipitously. Huge sums were appropriated by Congress to strengthen science not only at the college level but at the high school level. Other huge sums were appropriated for myriads of university research and development contracts. The demand for scientists skyrocketed right out into space; salaries of professors of science approached $30,000 per year. It was education's most pleasant moment. But it is gone now; in a few short years the public has swung to the position of wondering whether it might not come out ahead by doing away with higher education altogether. Even some students think it might not be a bad idea.

Despite its perennially negative image, higher education has enjoyed a remarkably steady growth. At the time of the Civil War about 1% of American youth went to college; that proportion has risen continously, almost without ever faltering, until today it is 50% and moving higher. There are responsible projections that it may rise to 80% by 1980. Growth occurs mainly because Americans are convinced that a college education is a good investment. In earlier days it was a good investment because a college degree almost certainly gained the holder entry to prestigious careers; more recently it is regarded as a good investment simply because lack of a college degree almost guarantees that one will have to spend his life in careers with a low status. Thus it is not love of learning but desire for status that has led most American parents to take the risky step of entrusting their children to those dubious creatures who have somehow captured the halls of learning; they would be much happier about the arrangement if the professors could be replaced by good solid American citizens but, nevertheless, the benefit seems to them to outweigh the risk.

Parents are correct in their belief that there is job discrimination against those without a degree. The discrimination is so rampant as to be almost unbelievable. One of us, a few years ago, helped carry out a survey of a very large federal agency to explore the extent to which there might be discrimination against employees because of their race or sex. There turned out to be little, if any, discrimination on either of these two counts but there was absolute and total discrimination with respect to lack of a college degree. Civil Service Grade 11 is toward the middle of the hierarchy of government positions; in this agency not a single person without a degree occupied Grade 11 or any higher level position. All those degreeless persons were held below it no matter how able, no matter how long they had served the agency; and some of them were extremely able. On the other hand, young fellows with degrees went whistling right through those lower levels and into Grades 12, 13, and sometimes 14 before they were 35 years old. An amazing aspect of the whole business was that there was not much bitterness felt by the degreeless persons about this kind of discrimination even among those who knew quite well that their ability far exceeded that of persons who had passed them by. They had been brainwashed by our society and our educational system into believing that they had condemned themselves forever, many years ago in their youth, and hence that there was some modicum of reasonableness in the outrages that government personnel policies were perpetrating on them.

Ivan Illich's reaction to this phenomenon is that our antidiscrimination laws, which forbid discrimination on account of religion, race, sex, or state of origin, need now to be amended to forbid also discrimination on account of amount of education. He suggested that such a move would reduce attention to the process (schooling) and increase attention to the substance (learning); it might bring about a most salutory revolution in education not to mention a quantum jump in justice in the world of work.

We have noted here an unfortunate result of the almost universal acceptance of the idea that higher education creates the elite corps of society. In colonial times it was obvious that universities provided the nation with ministers and civic leaders who definitely constituted the elite of those days. Since that time the ranks of the elite have expanded steadily to include professional men and business leaders; then a century ago the Morill Act created agricultural and mechanical colleges across the land to bring still other occupations into the elite corp. Later, school teachers and a host of scientists became part of the elite and still later social scientists and even social workers joined the corps.

European nations have been very conscious of the necessity to limit the elite. In fact they engage in careful planning with respect to the numbers of experts of various kinds a nation needs (or has positions for). If there are 1,400 jobs for Ph.D. physicists in the nation, then the university physics departments will train only enough Ph.D's to maintain that cadre. The United States has taken the opposite view; if people want to become Ph.D. physicists in far greater numbers than there are places for them, let them go right ahead. Those that do not find places will tend to become entrepreneurs and create places for themselves that make reasonable use of their expertise. Thus, the nation will not lose by making a wasteful investment in an unneeded skill but will gain by the establishment of new productive endeavors. So far, that policy has worked reasonably well; educated people do frequently exercise considerable ingenuity to create satisfying roles for themselves.

This report assumes that this process will continue on a still greater scale. It has been constrained in the past by the notion that the new endeavor must be economically viable. In the affluent society that constraint is not at all necessary and young people are beginning to realize it. We assume that in the future there will be increasing pursuit of careers distinct from one's livelihood. A great deal of the work that must be done to provide people essentials such as food, clothing, shelter, communication, transportation, learning, recreation and government is dull. On the other hand, more and more people are obtaining higher education; in order to earn their livelihoods a great many of them will have no choice but to settle for dull jobs which barely use their education and give them little or no intellectual satisfaction. The real meaning of their lives will, therefore, have to be found elsewhere; their true careers will be in activities that may have nothing to do with their jobs--activities that are limited only by their personal aims and ambitions and not by the unavailability of employment in the domain in which they are interested or by the necessity to get along in some corporate or bureaucratic structure.

This is the situation now; we are not referring to something that may take place in the future. We already have college graduates performing the most humdrum jobs, and it is clear to most of them that these jobs are leading them nowhere or, at least, can only lead them to a slightly less dull, higher paying job if they are willing to put an inordinate amount of effort into getting promoted. They are, therefore, finding careers outside of their jobs in a tremendous variety of social, community and cultural activities. Until recently, however, a person who decided not to devote sixty hours a week to his forty-hour-a-week job in order to scramble up the salary ladder had in some vague way decided not to succeed. Now young people are changing that view and according full honor to those who prefer to focus their careers on community or cultural activities. For these young people, Ralph Nader is a far greater man than the presidents of our huge corporations or the heads of our huge bureaucracies.

As a matter of fact, it is true today that the primary careers of the majority of Americans are not particularly connected to their livelihoods. This majority consists of most women, many members of minority groups who see that success in the livelihood game holds little promise for them, and a significant fraction of men who give less energy and devotion to their jobs than they do to their avocations (hobbies, crafts, music, drama, painting, religion, education, politics, sports, civic enterprises, public service, etc.).

Thinking young persons on our most select campuses are very much agreed that in some respects the American Dream is turning out to be a nightmare.

They observe quantities of children in the rich land who are hungry and living in wretched shacks. They observe that racism is still rampant despite everybody's agreement that it is evil. They observe that we still insanely destroy our views and harbors and land and air. They observe that despite widespread revulsion at home and abroad, we continue to slaughter destitute fishermen and rice farmers in a corner of Southeast Asia with such determination that we spend billions of dollars per month on it. They observe that many of our citizens had much rather take a long time to eliminate these iniquities than endure any small disturbance of their creature comforts.

The heart of the problem appears to many of them to lie in one basic assumption underlying the accepted American life style -- to work hard to achieve financial success, even to the point of not worrying about consideration for one's fellow citizens, and then enjoy the good things of life which are assumed to be purchasable. These young people reject that life style because they believe that profitable enterprise is immoral when one puts his fellow man in positions where he must warily look out for himself if one has an advantage over him in talent or education or capital. This conduct sets men against each other; it breeds distrust; it destroys the natural community of interest of all the people marooned together on this planet. To emphasize the point, some of them go so far as to reject money beyond what is needed for minimum subsistance; they do not by correct clothes or cosmetics or razors or haircuts; when they must have an automobile they buy an old automobile, never a new automobile; they want to make it very clear that they are not contaminated with and do not worship money.

To replace the conventional American life style they are searching for and experimenting with other life styles which would be less destructive of our planet and our global community. These life styles often have their aspirations outside of the job. The job has to be done because one must do his share of the chores of the community (providing food, clothing, shelter, transportation, communication, etc.) and if necessary one may spend forty hours a week at it although ten or twenty might be enough if society were not so heavily engaged in all manner of ridiculous wheel-spinning enterprises. If one seriously wants to get away with only ten or twenty hours a week of chores he might join or create a commune of some kind. (In actual practice that device seldom works because communes rarely have sufficient capital or good management; without those, one can find himself working just as long and hard as he would at an ordinary job and getting much less done.) In any case, it is an important aspect of this philosophy that one be fairly choosy about the job he does take. It must be related to real human needs--not artificially created desires. It must definitely not involve salesmanship which is regarded as something of a confidence game aimed at persuading people to put some of their money into your pocket; people are not free who have to make their spending decisions under aggressive arm twisting of high-pressure salesman and high-pressure advertising. On the other hand, collecting garbage or cleaning floors or washing dishes are quite honorable jobs because they have to be done. Whatever his job, as one gets experience and higher wages and occasional promotions, he will often work fewer hours, rather than raise his standard of living, so that he will have more time to pursue his real aspirations.

Where might those real aspirations lie? In any of the endeavors that have given people a sense of personal worth in the past. One favorite will surely be political action--organization of people in a community to achieve legitimate community aspirations, to make the community a beautiful and pleasant place to live, to thwart those who are trying to get personal profit at the expense of the community. Men have always received great personal satisfaction from the exercise of political power and that satisfaction is redoubled when it is exercised for the benefit of community as opposed to private interest. It is easy to do if one is willing to put a great deal of effort into developing a constituancy of like-minded individuals who can be counted upon to act in concert when an issue arises. Then there is the larger arena of political action in which one joins with others in the large city or state or nation or the world to exert political pressure; it is a delicate, complicated endeavor to parcticipate in forging large constituencies but the rewards in personal satisfaction are tremendous with every success. We as individual citizens need to create international organizations which will build bridges to the citizens of all other nations of the world; the sometimes inept policy of our government to try to coerce or bribe other nations to behave as it desires has made enemies for us all over the world. Something very positive and constructive could be done to counter that state of affairs; it might eventually bring us a truly secure position in the world community (as opposed to a fearful arms supported position.) Another important political arena has to do with civic service in formal and informal community organizations: school boards, community action councils, welfare organizations, youth organizations, hospital committees, school advisory committees, and so on, not to mention creation of new such activities (environmental improvement, for example) and building authentic status for them within the community decision structure.

As an example of a political action career we may consider the very popular one among able young black citizens of eliminating racism. It has no income potential whatever; yet it is an extremely important career dedicated to removing seriously disrupting tensions from our society. Universities have fumbled the ball miserably in preparing students for that career despite explicit and extensive guidance from students as to what they desire. They want to develop and organize black power and deploy black power to deal with racism. Universities have the greatest difficulty getting that message and persist in offering courses which teach the history of racism, which explore the manifestations of racism, which elaborate the psychology of racism, which delve into the interactions of minority cultures with majority cultures and comparisons of the ways in which majorities have traditionally repressed minorities. Some of this stuff is useful background information but it does not get to the heart of the career which must be concerned with action. What are the advantages and disadvantages of various kinds of action (negotiations, collaboration, boycotts, confrontations, strikes, education, lawsuits, nonviolent rebellion, political campaigns, use of due process) to alter laws and rules and regulations? Which actions are most effective in what circumstances? What tactics and strategies will best assure success of actions?

Universities have shied away from this kind of career training because it may have minor revolutionary aspects and they are fearful that some of their financial support may be jeopardized. They must get over that fear. It is not just black people who wish to change some of the rules and institutions of society; there are all kinds of formerly voiceless people finding their way to the campus who want to create minor revolutions of one kind or another with respect to fraud, privilege, pollution, exploitation, tax loopholes, destruction of the planet, incitement to war, secrecy, bureaucratic arrogance, predatory merchants and repairmen, contrived scarcity of goods and services, and other sad aspects of our civilization. People are likely to make careers of correcting these defects much more frequently than they have in the past; those careers require that they know how to change the way society operates when the accepted mechanizms of change are controlled by those who stand to lose by the change or at least think they stand to lose. Actually, of course, everybody loses if society comes crashing down as it surely will if its injustices cannot be corrected. Higher education has a major responsibility to give relevant education to those who wish to prevent that; to do so it must understand and expose the flaws in our society and try to develop alternative social arrangements which will alleviate those flaws without doing serious damage elsewhere. It cannot hope to fulfill that educational responsibility if it is fearful of the consequences.

A quite different realm of aspiration is in cultural enterprises in association with others. Participation in musical groups which perform locally and perhaps who make records to try to reach larger audiences bring huge satisfactions to many young people. Other groups make amateur movies and aspire to a level of excellence that will bring them large audiences or recognition in professional circles. Others create radio and TV programs which get at least as far as the local stations and sometimes much farther.

More personal endeavors appeal to many. The development of personal skills and talents can be exceedingly rewarding and bring one recognition far beyond what can be achieved by struggling up the corporate ladder. Besides playing musical instruments, painting, sculpture, crafts of various kinds, athletics, photography, there are all the academic disiplines. Eric Hoffer proved that one does not have to possess a Ph.D. to make significant contributions, and the same is proved every day by amateur chemists, mathemeticians, phychologists, economists, geologists, botanists, astronomers, and so on who have become so expert by their own scholarly efforts that they have advanced the knowledge in fields usually deemed to be reserved for the highly educated. It is actually very much easier than most people suppose because academics tend to wander off into esoteric little crevices and get trapped there leaving practically the whole domain wide open to whoever wants to occupy it. Philosophy is an excellent example; whole philosophy departments in outstanding universities have renounced the world's philosophical problems to cultivate a narrow branch of abstract mathematics. Amateur scholarship holds tremendous potential for personal aspiration to achieve great rewards. Of course it is well known that creative writing is a most attractive avenue for personal aspiration and has been for a long time.

A quite different domain of aspiration which is most satisfying for many persons lies in rich interpersonal relations with one's immediate associates--family, friends and neighbors. The goal is thoughtful concern for the welfare and interests of these associates; the reward is an enviable life spent among people who hold one in high esteem and affection.

Finally there are those who, as Kenneth Rexroth has put it, say simply, "Please let me alone, man; I just want to do nice things with my friends." There is nothing wrong with that philosophy of life. Kenneth Boulding has pointed out that the world might approach utopia if everyone could become 100% selfish. Most of the world's problems arise from the circumstance that too many people are willing to damage themselves in order to damage somebody else.

The poets and the painters of old in their garrets were the precursors of the new life style. And their formula is unchanged. Instead of working hard and getting oneself into a secure economic position so that he can do what he really wants to do, one proceeds at once to do what he really wants to do. It's simply a matter of learning to live on beans and cabbage, so to speak.

Once the idea catches on that it is perfectly reasonable to choose one's primary career independently of one's livelihood, we may expect that society will become vastly more complex. We may expect, particularly, that a multitude of new organizations will be formed as persons in new careers desire to associate themselves in pursuing their endeavors. Organizations, in any case, have been proliferating at a great rate as a result of rapid improvements in communication and transportation technology; we are merely suggesting that the rate may become still greater. There is little doubt that individuals, on the average, will participate in far more organizations in the future than they have been accustomed to do in the past. The question raised earlier about the possibility of there being too many chiefs and too few Indians may not be a problem at all; a person will be a chief in some organizations and an Indian in others. All these new organizations may require all the chiefs we can produce.

While these quantities of new organizations may complicate life, they may simplify it too. Organizations can be very specific as to purpose so that persons who support that purpose can join in freely without worrying about comprising other goals they may have. Further, that kind of specificity could make life much simpler for organizations which now find themselves embroiled in matters wholly foreign to their purposes. For example, universities are being called upon by some students to stop the war in Vietnam; universities would be delighted to refer such students to an organization specifically dedicated to that purpose; perhaps also students who were concerned with that issue to the exclusion of every other would be delighted to leave the university for a year or so in order to devote their full energies to that organization. We are simply suggesting that proliferation of organizations could simplify society in one respect by reducing intraorganizational strife; Birchers and Black Panthers might work happily side by side in an organization determined to concern itself solely with defeating gun control laws.

We need have no fear of educating too many people because there are many, many dimensions of society now receiving little or no consideration that badly need the vigorous efforts of educated persons; further there is good prospect that more such efforts will be forthcoming as the affluent society makes it possible for young people to take seriously the possibility of separating livelihood from career.

CHAPTER 5

RECOMMENDATIONS

We have one recommendation for the international community to the effect that the global village desperately needs a number of international universities. It appears to be impossible to achieve balance in educational programs in the contexts of the biases of nationalism. Many universities of the United States provide examples of the extreme distortions that can arise; their research programs are grossly out of balance because the bulk of funding for research arises from military needs or from preoccupation with the scientific underpinnings of weapons system technology. Naturally the education programs, especially at the graduate level, cannot escape being out of balance if the research program is out of balance.

We have one recommendation for the U. S. Government which we believe is of such overriding importance that we make no other recommendation exclusively directed to the Government; we do not want to contribute to any dilution of effort toward this one. It is that there be created a United States Video University which would use at least one full time television channel (and perhaps several) and which would rely primarily on video cassettes as a teaching device. It would maintain a huge supply of these cassettes for rent at very low rates. The television channel would be used primarily for giving information about educational programs available on the cassettes and for stimulating their use. The goal of this university would be to make all levels of postsecondary education available to all persons of all ages cheaply and conveniently in their homes. The matter of its cost is not particularly important but it does appear that this university would eventually make obsolete a great deal of the higher education that is carried out today on campuses and hence might actually reduce the total cost of higher education in the long run. There is no blueprint for the Video University provided in this report. There is an indication in Chapter 11 of one form it might take; the British university of the air, briefly described in Chapter 26, suggests another format. But these are the barest suggestions. The design of the U. S. university of the air requires a separate and extensive investigation.

We have one major recommendation for financing higher education which is addressed mainly to state and local governments but partly to the federal government which would also probably have to take some coordinating role. The recommendation is that all, or essentially all, of tax support for higher education be parceled out each year as education grants to high school graduates and high school dropouts in a manner that would equalize their financial capability to purchase advanced education taking into consideration the financial resources of themselves and their families. Some justification for this recommendation may be found in Chapters 1 and 8. It contemplates that public institutions would raise their undergraduate tuition sufficiently to compensate for their loss of tax revenue.

We have a long list of recommendations for institutions of higher education as well as regents, trustees, legislators, congressmen, and others who have some measure of control over the institutions or over higher education policy. We simply list the majority of them here with little or no supporting argument so that our recommendations will be collected in one place; at least some justification for most of them will be encountered during the course of the report. Numbers in parenthesis indicate chapters in which material related to the recommendation can be found; we shall not, however, refer to the third section of Chapter 1 which to some degree bolsters every one of our recommendations.

1. Very different learning situations should be devised which would get students off of the campus a large part of the time and into the real world where they would learn from real activities. The passive note-taking-at-lectures mode of learning is vastly overused, is not a particularly effective learning mechanism, and is not very appropriate for persons beyond the age of twelve. The classroom can provide only artificial learning environments; persons who can do things can be put to work doing them and actually learn something by making mistakes and observing the consequences. Community service projects would make excellent off-campus activities; for example, students could tutor public school students who were not doing well at school; could inquire into why they were not doing well; could try to get the school to deal with lagging students differently, perhaps by shifting them to other classes or other teachers or other curricula; could bring educational problems which they perceive to the attention of the local school board and attempt, through that channel, to improve education in the community. Environmental issues can make excellent projects; students could seek out polluting activities and attempt to bring local authority to deal with them, could monitor zoning variances and attempt to ward off those that would

degrade environment, could try to strenghten zoning ordinances from the environmental standpoint. Students could observe local public officials and public employees in the performance of their jobs and try to bring rewards and recognition to those who were doing their jobs well and fairly; they could monitor the practices of local merchants, repair services, insurance agents, private hospitals, etc. and try to shift public patronage to those businesses that deal fairly and legitimately with their customers. Any of these kinds of projects and many others involving various agencies of society would give students firsthand insights and experience in the written and unwritten rules by which society operates; at the same time they would get valuable education into tactics that do and do not appear to be effective for getting rules changed. (4, 8, 12, 13, 17, 20)

2. Institutions of higher education should recognize that many careers of the future will not be primarily income-oriented and cease concentrating curricula primarily around options to earn a livelihood; there must be designed all manner of new curricula for careers that, though they have heretofore been ignored because they have no income potential, have tmememdous personal satisfaction potential or social benefit potential. There must be serious attention given to the kinds of social action careers that will satisfy the demands of some of our most able and concerned youths. They are excited about eliminating serious defects in our society: racism, militarism, privilege, injustice, poverty, exploitation, ignorance. Society should be delighted to have them attack these issues. Higher education

should be anxious to prepare them to do so as effectively as it can. There are a great many other careers not connected with social action that higher education has neglected because they have no significant employment potential. These have to do with all the more conventional community and civic and cultural enterprises that good citizens occupy themselves with when their jobs are not sufficiently rewarding. (4, 12)

3. There should be vastly more attention given to assisting students make sensible career choices. It is not enough simply to provide information about the pros and cons of careers because satisfaction with a career choice depends very much on the individual making the choice. Every student should be individually counseled so that there will be reasonably good assurance that his career choice will not be sadly out of step with his personality, his abilities, or his needs. Failure of a student in his career must be regarded as, in part, a failure of the college that prepared him for that career. It is essential that colleges level with their students about the prospects of various careers that might be launched by their college work. What, for example, might be the realistic career expectations of a student who earns a Bachelor's degree in physics from Mountain Hole College? A fair appraisal of the frustration that such a physicist may well encounter might divert him to a different career with a different set of satisfactions and dissatisfactions. It is essential that the appraisal of careers give just as much attention to other important dimensions as it gives to the income dimension--

some of these dimensions are self respect, social power, understanding of the milieu in which one lives, love and affection, the recognition and appreciation of one's peers, the exercise of one's skills, the satisfaction that comes from creation, significant participation in significant endeavors. (8, 10, 12, 20)

4. Higher education should abandon its certification function. In any case grades and degrees will begin to decrease in importance as more people choose careers that are independent of employment and hence of artificial employment hurdles. This is not the primary reason, though, for the recommendation; certification conflicts with the educational aim of higher education; it puts students and professors in an adversary position with respect to each other whereas true education requires that they be in collaboration. If students could relax in the belief that faculty were genuinely concerned with their education they would not have to make judgments about whether such and such requirements of the professor were in fact educational exercises or were, in reality, simply sorting devices; they would then be free to ignore elements of the course that are not particularly relevant to their interests or careers and to concentrate on other aspects which they deemed to be especially significant to their careers. Professors would be free to personalize student assignments because they would not need to measure students against a common yardstick. Students could help each other out entirely freely with the competition between them for A's eliminated; they could even perform assignments together and the professor would be pleased to

have fewer papers to mark. (He would mark them, not for grading purposes, but solely to feed back information to the students about their deficiencies, errors, and omissions.)

There is the further consideration that certification will become even more meaningless than it is now (e.g., in claiming some kind of equivalence between the Mountain Hole B.A. and the Harvard B.A.). With the increasing separation of careers from livelihood, students will be designing their own unique careers and will therefore be the primary judges of what constitutes relevant curricular material and what constitutes adequate scholarly accomplishment with respect to that material. (4, 16, 18)

5. Entrance requirements should be eliminated. No person who desires advanced education should be denied the chance to obtain it. The person himself, not the educational institution, should make the decision as to whether it is or is not worth his while to pursue education. Since he is the designer of his career the institution is hardly in a position to judge that none of its offering can assist him in that career. The open admissions policy of CUNY is getting close to this recommendation and deserves society's most enthusiastic applause. It is a corollary of this recommendation that elitist admission rules practiced by certain public institutions be abolished; for example, the University of California requires that a beginning student be in the top one-eighth of his high school class. Such a qualification may be no indication at all of competence for social action careers; it may indicate rather a person inclined to conformity and compliance. (4, 8, 16, 17)

6. Colleges should encourage most students not to return for their sophomore year. More than ever, advanced education must be interlaced with career experience. The pursuit of great varieties of new careers, many of them unique in certain respects, means that there is no authority to declare what education and training can best support a given career. The individual himself, as he follows his career, will encounter situations which he does not feel entirely competent to handle or which he believes he could handle very much better with additional education or which gives promise of increasing the consequences of his career if he could better understand and deal with them. This is the authentic basis for educational demand and one which insures that higher education will be effective. After the freshman year a person will have an excellent notion of what kinds of learning experience can be obtained on the campus; he will therefore have a good basis for judgment as to whether and how often he can profit from such experience.

There is the further consideration that despite the best of counseling, a sizable proportion of people will get into wrong careers. Society can do without the waste of devoting four years to the wrong career preparation of those people; the individual himself may be so stricken by the prospect of that waste of his own time and money that he will spend the rest of his life in the wrong career. A general understanding on the part of both students and institutions of higher education that career choices are tentative and will likely be modified (if not changed completely) might do more than anything else to improve the effectiveness of higher education. Students would then understand that their educational programs could not be laid out in advance of their getting enough experience to make personal decisions about the directions they would prefer their careers to take; they would return to campuses with clear educational objectives and make much more effective use of campus opportunities than is possible now with only hearsay evidence of the nature of their anticipated careers. (8, 13, 16, 20)

7. All youths should take their take their first year of college work in residence at a campus away from home. The main reason for getting away from home is to escape from constraints that would tend to limit the range of career options they might consider but there are other important reasons. This recommendation depends strongly on the third recommendation for much more extensive counseling. It implies that higher education will take a large responsibility for helping students into meaningful careers and will generally assume that earlier career choices which the students may have made will likely need revision since they were probably made on the basis of all too narrow a range of possibilities. (8)

8. Institutions of higher education should be fully financed by tuition and society's subsidy to higher education should be wholly distributed to students in the form of grants to enable them to pay the necessary tuition. The purpose, of course, is to transfer a little power from institutions to students. There would be keener competition among institutions for students under this policy and hence a greater

inclination on the part of institutions to discover and satisfy the needs of students. (8, 10)

9. Students on every campus should organize and bring strong pressure on faculties to carry out their teaching responsibilities. Further, students should form a national organization for the purpose of influencing public policy with respect to education at the local, state, and national levels. Jencks and Reisman have thoroughly documented the rise to power of the faculty and the distortions produced in higher education by the faculty's natural pursuit of its special interests. It will not help to try to offset faculty power by increasing administrative power because administrators come, by and large, out of the faculty and hence unconsciously find reason in unreasonable faculty positions. Determined students appear to be the best hope for bringing some kind of sensible balance to the activities of institutions of higher education. (4, 6, 10, 21)

10. Alumni should be brought directly into the educational enterprise. Every youth should have an alumnus assigned who is engaged in the career the youth has chosen (or something very close to it); the alumni would advise them during the first several years of their careers as to what they should be learning and how they can best pursue their careers. If the career does not provide a livelihood the advisor would help find a job that would not interfere seriously with the career. The purpose of enlisting alumni, however, is not only to smooth the way of students into careers but to bring to the

campus a first-hand knowledge of the real world. Most faculty members are not well connected to the world because they have spent their entire lives in educational institutions; as a result they can give youths wrong directions or bad advice as to how to achieve their ambitions. (It has been suggested by Richard Hamming that the distance between the campus and the rest of the world could be much reduced by not permitting anyone to be recruited to the faculty who has not had ten years of experience outside of educational institutions. It is an excellent idea and one that could do wonders for relevance.) (8, 13, 20)

11. Degree requirements for faculty positions should be abandoned and every position filled by the most able applicant regardless of what degrees he holds. Success in many other careers can be just as indicative of a good teacher as success in graduate school. (8, 12)
12. Students should be given a formal role and a full veto in the processes of employing and promoting faculty members. (6, 18)
13. Teaching and departmental research budgets should be separated and the position of each faculty member specified as to how much of his salary is coming from the teaching budget and how much from the departmental research budget. (10, 18, 23)
14. Faculty members should report to their institutions each year all outside income-producing activities including time spent on same and amount of income from each. Book, record, and film royalties would be included even though no time was spent in producing them during the reporting year. (1)

15. Tenure should be abolished; it must remain illegal to terminate faculty appointments for political reasons but there should be no problem at all about terminating appointments of those whose teaching or research performance is poor. (8, 10)

16. Lower division lectures should be broadcast over national or regional TV networks by university consortia with individual campuses carrying out only the discussion section and laboratory aspects of the instruction. For the general listener there should be made available kits for doing experiments in the home and there should be a mechanism which enables listeners to identify neighbors who are following the lectures so that they can get together regularly for discussion of the lectures and associated reading material. (11, 25, 26)

17. Curricula should be reorganized to enable persons to climb career ladders without wasteful duplication of educational effort (as, for example, nurses must undertake if they wish to become M.D.'s). (12)

18. There should be made available throughout undergraduate education opportunities for group learning activities and collaborative projects in which students are working jointly instead of competitively to achieve educational goals. (4, 8, 16, 17)

19. There should be made available throughout undergraduate education projects entirely run by students which permit students to learn by making mistakes. Faculty would point out and analyze their mistakes but would not hover over students and prevent them from making mistakes. Campus housekeeping and recordkeeping activities might be excellent vehicles; that is, students might manage campus housing,

cafeterias, traffic, parking, bookstore, library service, production of directories, registration and other class enrollment matters, student payroll, etc. (4, 8)

20. The tracking system which channels academic performers into universities and less academically inclined students into state colleges and junior colleges should be abolished. (8, 16, 18)

21. Substantial economies can be achieved by neighboring institutions by combining their libraries into one library and their computers into one computer. (19, 24)

22. Research output should be evaluated. Although not terribly meaningful, pages and circulation of research documents might well be counted. Citations of research documents should definitely be counted and it would not require any great extra effort because most faculty members already follow very closely citations in the more important journals of their papers and books. (21)

23. All research findings should be translated into layman's language so that regents, legislators, congressmen and others concerned with educational policy can judge the value of the findings and adjust research policy accordingly. (18, 21)

24. Teaching should be evaluated. A major component would be judgment of a teacher's competence by his students. Another would be measurement of how much students have learned using tests given at the beginning and end of the course. Another would be the extent to which students were stimulated to continue studying the subject as measured by their rate of enrollment in more advanced courses. (18, 21)

25. University budgets should be capable of much more flexibility so that almost any program could be easily costed out; administrators and policy makers would then be able to judge more accurately how resources might be shifted among various activities to increase efficiency. (18, 21, 23)

26. Royalty arrangements of some kind need to be devised in order to give incentive to faculty members to develop TV and CAI material. (11, 25, 26)

Now we turn to a few hopefully practical remarks about the immediate issue of how higher education might deal with increasing enrollments in the face of budget stringency. The general philosophy of this study leads to some simple answers to that question. We have no objection to institutions wailing loudly about the erosion of standards as enrollments increase without commensurate budget increases nor to their weeping copiously about the tragedies being visited on their beloved students by stringent budgets. But, in our view, institutions must never, never reject students because the budget is tight. All qualified applicants must be admitted and educated as well as possible with the resources available.

How? Cut corners by forming typing pools, reducing travel, hoarding supplies, and manicuring the grounds less frequently. Double and triple class sizes; if class room are not large enough, pipe lectures by closed circuit TV to residence halls. Beg or buy early morning hours of local TV stations to broadcast lectures videotaped the day before. Reduce research activities and increase teaching loads. Use upper division undergraduates as well as graduate students to lead tutorial and discussion sections for lower division students; use dormitory and rooming house living rooms for these section meetings if there are insufficient rooms on campus. Redesign lower division lab exercises so that students can do them on their own at home (thus eliminating the need for a great many lab assistants); convert the labs to classrooms. Bathrooms and kitchens can serve quite satisfactorily as biological and chemical labs if imagination and ingenuity are used to design lab exercises (and kits) with those facilities in mind. Physics lab education might even be improved by taking it out of the physics buildings and using all the marvelous gadgets easily available to most students: stoves, refrigerators and freezers, automobiles, radio and TV sets, record players, tape recorders, telephones, musical instruments, clocks, cameras, binoculars, bathroom scales, thermos bottles, small electric appliances, and so on. Stop giving courses for which excellent programmed texts have been developed and let the students plow through these texts on their own; they can be given occasional assistance by the faculty when they cannot find a fellow student who can help them over a snag. They would be given credit for the course by examination. Give credit for any course by examination. Produce good programmed texts for other courses that require little student-teacher interaction and stop teaching those. Assume graduate students can read, and eliminate graduate courses. Cancel all courses that do not get an enrollment of at least ten. Waive required courses if replacement of several sections by a single large (or TV) section creates impossible scheduling problems. Integrate extension and regular classes and curricula. Broadcast over TV those lecture courses that are given on every campus in a region or state and stop giving the lectures on each campus; campus activity in those courses would consist only of discussion sections and quiz sections. Devise field projects for college credit that would use other facilities (public schools, hospitals, churches, agencies of local government, etc.).

How much would economies of this kind reduce the value of higher education? Maybe a few percent. At the outside. Minuscule, beside the loss that might be suffered by rejected students.

None of these economies would be needed if some of our other recommendations should take effect. The general position taken in this report is that one year of full time higher education is enough for most persons and that the remainder of their higher education should be scattered through their careers as an occasional part time activity. To the extent that that is true, we may have too much capacity in our institutions of higher education. Some of the suggested economies could, nevertheless, be well worth adopting as a means of freeing resources that might better be used, for example, to expand the range of educational opportunity available to economically deprived segments of the population.

Finally, we have a few recommendations for foundations and research organizations.

1. There should be developed plans and programs for creating a system of international universities.
2. There should be developed a detailed plan for a U. S. university of the air.
3. There should be developed a detailed plan for fairly conducting every youth into a meaningful career with the amount of assistance provided each youth being somewhat related to his need.

4. There should be a thorough exploration of ways to finance open enrollment.
5. There should be a detailed survey of the extent of job discrimination with respect to amount of education. At the same time there should be assessment of reasonable minimum educational requirements of various categories of work so that estimates could be made of the amount of inflation in the educational requirements set up by employers.
6. There should be designed an extensive U. S. manpower information system to assist youths (and counselors of youths) to select careers with some confidence that opportunities in them will actually exist when the student desires to enter them.
7. There should be an extensive test of the proposal to assign every youth a college alumnus as an advisor (whether or not the youth plans immediately to attend college) to give him or her practical guidance about getting additional education and finding appropriate employment or apprenticeship.
8. There needs to be much greater illumination of the research activity of higher education so that the public can grasp how much research it is buying in each of the different disciplines and get some understanding of what the benefits are of various kinds of research.

CHAPTER 6

STRATEGIES FOR CHANGE

A formal organization such as a corporation, a government agency or a university is created to perform a task that is too large for one person to do; the task is merely subdivided into segmemts that can be done by one person. This simple little idea leads to extraordinarily complex organizational and communication structures which arise from the necessity to know when, why, and how people are doing what; they are necessary for coordinating all the individual and group activities in order to assure that the full task is actually being performed.

Authority is very diffusely spread through an organization and in a complicated way. Each individual has his own little domain of authority, generally having to do with the manner in which he carries out his segment of the task. The formal subgroup to which he belongs has a small domain which surrounds his own domain but in aspects which do not infringe upon it; the subgroup authority may have to do, for example, with the order in which he does his individual jobs. And so it goes up the echelons. Besides the groupings of the formal structure of the bureaucracy, there can be numerous other officially created groups consisting of committees, study groups, advisory groups, task forces and the like which have restricted domains of authority. Finally there may be informal coalitions with no official status but which are understood and agreed by all to have a veto on certain categories of actions.

The nature of authority is not widely understood; the popular myth has it that "persons in authority" issue "orders" to "subordinates." It is almost fair to say that it is the other way around (except in organizations controled by terror). Authority is effective only when the subordinate believes that the order coming down from the person in authority is reasonable. He is the "authority" on whether the order is reasonable; if he thinks it is not, he will not execute the order and has endless devices for not doing so at his disposal. He may: ignore the order, modify it by interpreting it in a way that looks reasonable to him, carry it out in a superficial ineffective way, devise a procedure that will insure its failure, apply it in an extreme way that will arouse widespread resistance, embark on a series of delays, organize opposition to the order, start building a case for why the order is impossible to carry out or why it is inconsistent with the goals of the organization or why it violates his conditions of joining the organization or why it would be inimical to society, and so on. This behavior is especially prevalent in bureaucracies in which it is difficult or impossible to fire employees.

Thus the authority of an order (or administrative communication) resides to a substantial degree in the subordinate. If he accepts the order, it is authoritative and will be carried out. A good executive issues only reasonable orders; he knows that one unreasonable order may cause him to lose his position of authority. That happens now and then even to corporation presidents, generals, and admirals who are popularly supposed to have tremendous authority.

Power in an organization is almost entirely veto power from the highest level to the lowest. Orders coming down may be vetoed by subordinates by the tactics indicated above. Recommendations coming up may be vetoed by superiors. Veto power must be used very sparingly if one wishes to remain in the organization. This is not to imply, of course, that there are no positive actions. Individuals make them regularly but they are merely suggestions and recommendations until they have run the gauntlet of vetoes. A member of an organization rarely attempts to do anything that has a fair likelihood of being vetoed either above or below him.

The description of all these interlocking domains of authority together with their connections and boundaries is specified in greater and greater detail as the organization ages. Members of a bureaucracy never tire of refining these elaborate and delicate arrangements. Having become accustomed to lavish attention on small details, it is no wonder that a proposal for change which might appear to be somewhat minor to an outsider will appear to be a cataclysm to a bureaucracy. It can find only madness in change that does not arise inside its own ground rules and survive its sequence of potential vetoes. The reverence for established procedure is wholly understandable even if one looks only at the time and tradition invested in it. But there is more than that which causes bureaucracies to resist change. Its individual members are enmeshed in a network of structures, procedures, obligations and expectations, which act as umbilical cords furnishing them emotional comfort and financial security. Resistance to change is fight for survival. Even in private business (where authority lines are clearly stated, goals are simple and unambiguous, and measures of cost and effectiveness are clear), intertwining self-reinforcing social forces actively oppose opportunities for change--even to the extent of bringing failure in meeting the goals for which the group exists.

Beyond these considerations, educational organizations are beset by many special problems which court paralysis against change. One of them is fundamental disagreement among educators about the goals of education. The progressive educators believe education should and does follow the lines of social change and will naturally adjust itself to meet life as it comes. They oppose attempts to specify clear goals about what the good society should be; the future, they believe is too uncertain to plan for in education. The conservative educators believe institutions should concern themselves with the individual; give him his cultural heritage and prepare him to earn a living.

The Reformists believe education's job is to rebuild society by teaching social reforms. They abhor the others' lack of goals and emphasis on the individual rather than society. They are much concerned about the obstacles to change and the need for rational planning.

In turn, the Reformist is criticized: for his ambition; for his lack of realism on the working of politics and deep cultural patterns; for his arrogance in assuming he can set goals for his culture; for his underestimation of other changes caused by forces such as population, pressure, and technology, beyond his control.

There are other swamps in which proposed change bogs down in education; for example, the differences, the difficulties, and the refusal to define educational objectives in measurable terms; and the difficulties in evaluating performance. One of the most ambitious plans--the Master Plan for

Higher Education in California--is content to specify its goals as "...to meet the needs of the State for the next ten years and thereafter." Its sixty-seven recommendations deal mostly with entrance requirements; accommodating greater numbers of students; cutting down on expenses; redistributing students among universities, state colleges, junior colleges, private colleges; faculty demand and supply, and so on. Almost no hints are given about what "the needs of the State" are or will be, or how the universities' performance in meeting these needs will be measured (beyond simply counting the number of students).

Finally, the complexity of the educational community itself is a factor in preventing educational changes from taking root. An educational enterprise, even a single university, is an elaborate organizational system. Many failures of promising innovations came about simply because their promoters failed to take into account unintended effects on other parts of the system.

Turning now to strategies for changing education, we begin with one which has been tried many times and does not work. That is the strategy of costing out a desired change, getting education's help to do so, then giving education the money to carry it out in its own way. The change does not occur; education simply takes the money and does some utterly trivial variation of what it had been doing all along. For example, during the past several years the U.S. government has carried out the most expensive experiment in history in an effort to persuade the public school bureaucracy to improve itself. As a part of the Elementary and Secondary Education Act, schools in low income school districts have shared in an appropriation of approximately one billion dollars per year intended to bring about more effective learning in children from economically or educationally disadvantaged families. This huge sum of money has accomplished almost nothing because the schools used it simply to do a little more of what they had already been doing in the past. The same Act provided an additional hundred million dollars per year specifically to finance innovative educational endeavors; the innovations turned out to be minor variations on the traditional theme.

Another prime example is described toward the end of Chapter 19. During the 1950's the Fund for the Advancement of Education poured some three million dollars into a project to improve teacher training in the State of Arkansas. Educators thoroughly subverted it. Paul Woodring's evaluation of it (in his Investment in Innovation, Little, Brown, and Company, 1970) concludes with this sentence: "Although the Fund officers had anticipated the opposition and obviously were not seeking to be popular with professional educators, they seem not to have anticipated that the opposition could undermine the whole project."

As an example of how difficult it is for an educational bureaucracy to change itself, we may observe the behavior of our own institution, the University of California, during the past few years when the Reagan administration has tightened the University's budget. The University's reaction has been to struggle manfully with the problem of limiting enrollments. Obviously if the class sizes are just right, the faculty-student ratios are just right, the scope of the curriculum is just right, the mix of the faculty is just right, and everything else the University does is just right, then the only thing the University can do with less money is teach fewer students.

There are exceptions to this blanket indictment that educational institutions cannot improve themselves; for example, the University of California and many others have relaxed entrance requirements to permit disadvantaged students to enroll--perhaps the most noteworthy change is to be found at the City University of New York which has gone a long way toward implementing a policy of open enrollment. But as a general proposition we may be sure that little increase in the efficiency of higher education will flow from its own initiative. It will view a minor change as huge and a large change as rampant revolution.

Another possible strategy for changing higher education is to drag it, kicking and screaming, by the budget. This strategy may have more promise than the financial carrot strategy, but to be effective a great burden must be assumed by legislators, regents, and trustees. To do a good job of it they must do vastly more homework than they are accustomed to doing. They cannot do it by focusing on matters of finance; they must focus on matters of education. They must find out what is being bought in the way of teaching, in the way of research, in the way of public service. They must make difficult value judgements about shifting the emphasis between various endeavors in considerable detail, then spell those shifts out in the budget, and then follow them up with an exact system of accountability.

It can be done. Laymen in high policy-making positions are all too prone to assume that the mysteries of atomic physics, the subtleties of symbolic logic, and the psychoanalysis of Shakespeare are beyond them. They are not; all these marvels of the intellect can be cast in laymen's language and be well understood by laymen; their implications and hence their potentential benefits to society can be appraised; then one can make a sound guess as to whether they are worth the money. It is the duty of policy-makers to do that; they are not doing their jobs if they do not. It is also their duty, for example, to judge whether the extra cost of 1,000 personally conducted classes of 30 students each is that much more valuable than one TV class of 30,000 students; they cannot leave such decisions to educators who have a vested interested in the existence of numerous jobs for educators; it may well be that the extra cost is easily worth it; we could feel rather confident about it if the right people had made the decision. This is to say that, if policy-makers are to bring about change by close control of the budget, then they must get very deeply into educational policy, curriculum matters, and even teaching methodology. If they do not, the bureaucracy will twist and squirm toward its traditional goals.

A quite different strategy for changing higher education via the budget would be to channel public support through students rather than through the bureacratic structure. That is, let institutions be largely or entirely supported by tuition and let the public support of higher education be given to students in the form of outright grants or guaranteed loans so they could pay the resulting high tuition. This device should tend to make institutions far more responsive to the desires of their primary customers--college students. The transformation would take a little time because of the inertia of the current beliefs of students and institutions about their respective roles, but in the long run students, by controlling the funds, would force higher education to serve their needs and they are mainly what higher education is there for in the first place. Even though it is something of a copout, this kind of marketplace budget control would probably be a far more effective strategy than would be attempts at detailed management control at the policy level. The latter would tend to be sporadic and would tend to put institutions of higher education too near immediate political issues when, in fact, they do need a certain amount of insulation in order to fulfill their mission of exploring society's options for the future. The marketplace control would be a continuing process always pushing for change, but in an incremental, nontraumatic fashion. That is, it would set in motion a process for bringing about continuous change whereas a large reform would be a single event which would become outdated and require another enormous disturbance later on.

Another strategy for changing higher education is to create a competing more effective and efficient bureaucracy which would relentlessly chip away at the domain controlled by higher education. Founding the U.S. university of air, as recommended in the preceding chapter, would constitute such a strategy. If any person of any age at any time could bring any course into his home on his TV set, a very large proportion of the present customers of higher education would decide that the extra time, money, and inconvenience of attending college was not worth it. Society would soon find itself educating people very differently from the way it does now.

Another effective strategy for reforming higher education lies entirely in the hands of students. If we may address ourselves directly to students for a moment, the strategy we have in mind for you is simply: Do not return to college next year! Get a job somewhat related to your intended career. If that is not possible, volunteer your full time services as an assistant to a person who is successful in the career; after a month or so of dedicated forty-hour-a-week service he will likely scrape up a salary for you. If not, and if you need one, switch to another person. Volunteer your time to a public service agency or government agency if your career is not firmly chosen; the world is full of very worthwhile endeavors that need all the help they can get; they too can often scrape up a minimal salary for a person who has demonstrated his dedication to working for them if he needs it. You have been attending schools for umpteen years now and are thoroughly familiar with how those institutions operate. Most of you will be spending the rest of your lives in other institutions; they operate rather differently from educational institutions. A year of poking around in one or more of those other institutions would be far more educational for most of you than would another year of school. You may make some interesting discoveries besides getting a very different and necessary kind of education; you may find out, for example, that you have been going to school too long already. You may find out that the career you had in mind is not nearly so satisfying from the inside as it appeared from the outside and change your mind about your career; that could radically change your educational plans; thus a year away from school could save you a great deal of misdirected educational effort. In any case, this respite from the educational treadmill will give you some personal basis for judgement about what to learn;

you will not have to rely on the pronouncements of educators about what you must learn and how you must learn it.

There is also the secondary consideration from your point of view, that you will be doing higher education a great favor; it is saturated with students these days and strapped for money; a drop in enrollments would simplify many of its problems. You will find also that higher education will grow fonder of you in your absence; it will urge you to come back and pay a little more attention to your wishes when you do; it will also be delighted that you have returned as a result of a decision that you want more of what it has to offer and are not simply attending because it is the accepted thing to do.

For the long run, this strategy is urged mainly on freshmen as a purely educational move. After one year of college, students will have a very good grasp of what kinds of learning they can expect to get in institutions of higher education. They can then move out into the world and begin to make their own assessments of the value of returning for more of that kind of formal education.

A very much milder but still useful strategy for students would be to demand a real voice in all administrative affairs of the college or university. Students might first try to do it by due process, relying on a strong logical case which would receive a great deal of faculty support (especially in humanities and social sciences) and which might go somewhat as follows:

Students make up the largest segment of the university community and they are as idealistic and thoughtful a group as can be found anywhere in society. It is a serious violation of the fundamental tenets of democracy that they be entirely disenfranchised with respect to the formal government of the college community.

A similar consideration has to do with the investment that students make in the enterprise. It is somewhat larger than that made by society. The magnitude of this investment surely justifies an important student voice in operation of the enterprise. (In the 1969-70 academic year society invested about $11 billion in higher education. The students and their families invested about $9 billion in fees and expenses. The students invested time which, measured in terms of foregone wages at $3,000 per year per student, amounted to about $18 billion.)

The university was created for students, but as a perpetual bureaucracy each institution has its own special interests which it naturally sees no harm in serving since it believes in and is fully committed to its mission. It can hardly avoid believing that anything that is good for the institution must be good for the students. Of course that is not true; there are conflicts of interest; one important one has to do with the value of research; another important one has to do with the value of teaching. Obviously the institution cannot honestly represent the students in such matters. Equally obviously the most effective way to repair the situation is to give the students a substantial voice in institutional affairs.

One of the greatest benefits of such a policy would arise from students' intuitions about the future. The direction of the future of man is controlled by his vision of the future; he is prone to do what he conceives he can do.

The vision of young people is superior in significant respects because they see important defects of society more clearly than those who have grown accustomed to them by long years of familiarity and rationalization. Their vision of the future sees correction of those defects and it is authentic because a time will come when they are in control. Thus, in some critical respects (not all respects because feasibility is a very important ingredient too, and more experienced people are better at that) they know better than the faculty what the future holds and hence what training they need in order to deal with it. This is the issue of relevance (value judgment).

Relevance has an unsettling effect on the concept of a college as a place which transmits accumulated knowledge from one generation to the next. That concept appears to be reasonably valid in the physical and biological sciences whose structures do not depend on value judgments; new views of relevance would change emphasis but would not have much effect on the organization of these bodies of knowledge. Professional schools (law, medicine, engineering, etc.) are slightly more but still not heavily dependent on value systems. On the other hand, changes in value systems can fundamentally alter the social sciences. We may point to the contrasting Harvard and Chicago schools of economics (and economics is the most "scientific" of the social sciences). Finally, in the arts and humanities, changes in the value system can cause wholesale revision of entire sequences of courses. We may expect then that a stronger student voice in university affairs would increase relevance of university programs and that the effects would be felt most in the humanities and social sciences.

There is no need to dwell on the widely conceded propositions that students are a prime source of information about the teaching ability of faculty members. They are not the sole source; colleagues can best judge a teacher's grasp of subject matter; but their view of a professor's devotion to good teaching, of the frequency with which he comes to the classroom well prepared, of his availability for personal counseling and attentiveness to special needs, can make a large contribution to upgrading the quality of teaching on the campus provided students are given a real voice in promotions and in assignmnet of faculty members to the teaching of required courses.

More generally, it is a reasonable expectation that not only teaching but student motivation might be considerably improved by student participation in faculty decisions. Students would work harder on a program which had a measure of their own design in it. The increased student interest might well have a catalytic effect in improving the morale of faculty members and their satisfaction with their jobs so that still larger increments of learning could be achieved.

Student participation in decision-making should add flexibility and adaptability to university operations. Students will be less impressed with and tied to the traditional ways of doing things; they will more often be inclined to doubt that the old ways are the only ways, they will see alternatives and opportunities that would not occur to those who are steeped in the system. To be sure, they will propound some wild ideas once in a while and time will have to be spent explaining to them why

why those ideas won't work. But that will be educational for all and that is what it is all about anyway; there will be times when it won't be at all easy to explain why those wild ideas won't work.

It will be tremendously beneficial to the students to obtain firsthand laboratory experience with the difficulties of changing organizational behavior and first-hand knowledge of the strengths and weaknesses of various tactics for dealing with entrenched organizations.

With full acceptance of students as voting members of the university community it is reasonable to expect unrest about campus affairs will essentially disappear. The tiny minority of fanatic destroyers will have little or no student frustration and discontent to exploit. The general public will no longer be frightened by demented events on campus. Who knows? Perhaps even budgetary stringency may diminish.

Surely a very large benefit will accrue to society with the appearance of college graduates experienced in bringing about change in an official bureaucracy. Bureaucracies are notoriously difficult kinds of organizations to change and never has society more needed citizens with skills for changing them. Justice is chipping away much too slowly at privilege in our society with the result that unbearable tensions are building up in large members of underprivileged citizens. Society desperately needs idealistic, knowledgeable, experienced reformers of established organizations; the universities can supply them by becoming themselves the laboratories in which the skills can be developed.

Meanwhile, society can benefit by seeing a demonstration in the universities of how social tensions can be relieved by giving a meaningful voice to those who have a perfectly legitimate right to influence matters that affect their lives.

The participation of students in college decisions can do much to bridge the generation gap to the great benefit of society at large. A sizable part of the gap arises from failure of communication which arises in turn from the very general and abstract level at which much of the dialogue occurs (love, relevance, personal values, humanistics, life style, brutality, revolution, nihilism, imperialism, etc.). There is nothing like spelling out the pros and cons of a very specific issue for discovering precisely where opposing groups agree and disagree and for determining how the issue must be worded to get sufficient agreement for passage by a voting body made up of the two groups. That is accurate communication and it can uncover large areas of agreement.

Finally society at large would benefit from the increased relevance of university research and university public service. Student influence in decision-making would tend to reduce esoteric research that is mainly addressed to confreres and to increase research that is concerned with the contemporary problems of society.

That completes our outline of arguments that students may use to try to win, by impeccable due process, participation in the decision structure of the institutions of higher education which they are attending. There are other less friendly measures that students can take which do not depend on persuading those in charge. As noted above, students can undertake to evaluate courses and professors and publish those evaluations for the benefit of other students. That has been done with considerable sucess on two of the nation's outstanding campuses: Harvard and Berkeley. The value of this tactic is not solely in warning fellow students away from miserable courses. It sometimes has the very salutary effect of causing professors to work harder on their courses in order to escape a failing grade in the published evaluation. It has been known to cause courses to be eliminated from the curriculum; it can even be effective in persuading incapable teachers to move elsewhere, or better still, move out of teaching altogether, but that is not very likely until a great many campuses institute the evaluation process and communicate with each other about migrating professors.

Another even less friendly strategy that students could carry out would be documented exposure of poorly taught courses. For example, students could tape record poor classroom performances by faculty members and replay them for department heads and deans; some of them might even make amusing entertainment for student convocations. The students in a class taught by a chronically poor teacher could go on strike and demand that the department relieve the teacher of the responsibility of teaching that course and assign another faculty member to it. The department will often be inclined to comply with that demand because its budget often depends on the total enrollment in its classes. Of course students engaging in such a strike run the risk that an unresponsive department may prefer to abandon the course so that the students will not be able to complete it or get credit for it. The taking of such risks by students may be essential if higher education is to be reformed.

A much more telling strike would be a nationwide one against required courses. That is, a student would complete whatever degree program he had chosen with the exception of one or two pointless required courses and would therefore not get his degree. For this to work without great cost to students, it would have to be widely publicized and widely participated in, expecially on the more prestigious campuses. There would then be little penalty in the failure to get the degree because employers would still be anxious to employ these students and would not be greatly disturbed about the students' substitutions of what they judged to be more worthwhile courses for less worthwhile courses.

The object of this strategy is, of course, to strike at the crux of bureaucratic power which is to withhold degrees from students who do not behave. As a matter of reality, that power is far less than it appears to be for the reason that so many people are getting degrees. When everybody gets the degree it will mean essentially nothing except as a fetish against job discrimination and we are already well down that road; the fact has simply not yet been recognized. Such a strike would expose it.

With exposure, a number of good and bad things would be expected to follow but, merely from the standpoint of the long run viability of higher education, the balance would be on the good side. Higher education would be serving its real customers--students--and not contaminating that service with concern about an artificial certification function for employers. The contamination seriously interferes with learning and its elimination alone would probably justify the strike many times over. A great many courses and a great many professors might suddenly vanish from the higher education scene; the professors could hardly stick around even if they have tenure if no one signed up for their courses. Thus, the strike might be a Godsend to administrators who are now helpless to remove tenured faculty members no matter how terrible their teaching performance may be. The removal of all this excess baggage from the campuses could significantly decrease time wasted by students and, hence, increase learning.

The bad thing that would happen is that some students would work less hard on their courses, with the threat of poor grades and no degree removed, but that is the inevitable price of letting people control their own destinies; some people will not do a very good job of it by others' lights, but no one will argue that that is sufficient reason to disavow freedom.

All of the strategies we have suggested for change have emphasized an agent who would insist upon it. That is the first and most essential requirement for change, a dedicated group of persons determined to bring about a change. The tactics they use are important too, and we shall conclude this chapter with a few observations about that.

It is essential to recognize that the desired change refers to changing a system--not a rule, not a practice, not a course, not a person, but a complete system. For a state university such as the University of California, the system would include such main component groups as the following--each being further broken into various sub-groups and special committees among which advisory and decision power may be delegated:

The State Legislature
The Board of Regents

University Administrators

Academic Senate

Departments

Individual Faculty

Interdepartment Organization (e.g. computer facilities, research institutes, etc.)

Students

Beyond these, powerful direct and indirect influences can be imposed by:

The Federal Government (Office of Education, the National Science Foundation, Department of Defense, etc. through research grants and policies governing their use)

Private Foundations

Professional Societies

Business and Industry

Local Governmental Agencies (law enforcement, etc.)

The Community

Each of these is an organization made up of individuals holding to their own values, vested interests, and life lines of social and economic dependencies.

In trying to effect a particular change, one need not ordinarily be concerned with all these component groups, but only those which stand as barriers, or those which might be mobilized against (or for) the change. We might call this group of elements the "response system." It is obvious that the response system for one change may be very different from that for another change.

For a change involving the content or teaching arrangement in one course (e.g. introducing gaming as a teaching method in a political science class) the response system may consist of one faculty member (and his particular social, professional or economic ties) and perhaps the Department Chairman. If the change is to bring a new "unconventional" faculty member into the department (such as a new quantitative political scientist into a traditionalist department), it may be likely that all faculty members of the department will mobilize against the newcomer.

If the change is to bring in computer-based learning machines under a grant from the Office of Education, then several sub-levels of administration, the interdepartment computer facility, officials and regulations of the Federal Government, and the Regents are likely to be involved.

If the change is to explore even preliminary steps toward creation of the U.S. University of the Air, then virtually all elements of society--education, government, business and the general public--would make up the response system.

One may not be able to be concerned with all elements of a response system, but he should have a general understanding of what its position might be and especially how its power (to resist or to support the change) is distributed with reference to a specific change, so he can plan his change strategy accordingly. This is no trivial task, since one is asked to know not just how the university system works, but how it will work when confronted with a new situation. The patterns of power can change in the face of confrontation.

The Board of Regents, the supreme legal governing body of the University of California retains certain powers, but for practical purposes, delegates many advisory, review and decision powers to committees, Chancellors, the Academic Senates, etc. These, in turn, may delegate to assistants and sub-committees. Thus, there is a broad diffusion of power under which day-to-day operations are carried on. But in the event of certain changes (e.g. as the hiring of an Angela Davis or the publication of unacceptable material by the student newspapers), the Regents may quickly pull back or realign their delegated powers to resist (or promote) change.

In similar fashion, the legislature, by control over the budget or by enacting new laws, may exert its power. The community may mobilize for or against change and make its will felt through political power by voting down bond issues for university financial support or simply be making its voice heard through the media and through its elected respresentatives to get its way.

The point is that accomplishment of changes must be given the careful thought and planning given to a well-run political, military, or fund raising campaign. That is: mapping the battlefield, sifting intelligence on opposing forces, planning tactics and strategies consistent with available resources, judging the probability of success and acceptability of possible failures, forming of alliances within and without the education empire, etc. Some strategies may require only a little diplomacy, others some psychological warfare, some a long determined campaign with battles on many fronts.

There is no simple theory or doctrine that can unerringly guide the innovator to success. Theories which focus only on rational choice are probably not sufficient, although the basic concepts and rules of them, and experience with them in many fields, offers an arsenal of possibilities: small group psychology, attitude assessment, studies of successful innovations in business organizations, organization theory, advertising, incentive analysis and others. Perhaps lessons learned from recent experiences with urban planning may be useful: this endeavor represents the most extensive effort in peacetime of producing changes in a complex segment of our society. Gunnar Myrdall, lifetime champion of planned change, suggests that one general principle for accomplishing it is education:

> The first condition for planning in a democracy like the United States is to reach the people and enlighten them in regard to both the social and economic facts, and to the policy conclusions to be drawn from the ideals and the fact. (Otherwise)...planning becomes nothing more than an intellectual exercise among a small sect of devoted participants who will, moreover, remain under constant temptation to compromise their plans in order to have something accomplished, however inadequate and perverted from the point of view of their program and the real needs of society.

PART II

SOME ALTERNATIVE ARRANGEMENTS FOR HIGHER EDUCATION

CHAPTER 7 - INTRODUCTION

There are presented in this part of the report some models of higher education that differ in essential respects from the institution as it exists today in the United States. The fundamental purpose of the models in our plan for the study was to take account of interactions between the changes and innovations that our surveys might indicate were very promising. An innovation might appear to have tremendous potential on its own but not fit very well with any reasonable institutional structure. Similarly there is the problem of examining whether several promising innovations can be fitted together in any rational way to realize their preserved benefits simultaneously.

Some of us had in mind at the beginning of the study that we might eventually combine most of the good ideas that we were agreed upon into one grand design that would be the best of all possible models for the nation's system of higher education. We have given up on that. For one reason, the good ideas are not so self-accomodating that they combine very well. There are no easy tradeoffs, for example, between the good idea of increasing the efficiency of transmitting knowledge by use of technology and that of increasing opportunities for social development by extensive small group activities; or between the good idea of making higher education available to all and that of devoting higher education resources primarily to those who can make the best use of them and hence return most to society; or between the good idea of educating everybody to the fullest extent and that of seeing to it that every highly educated person has a job that interests him and makes good use of his education.

Then there is the consideration that people differ and doubtless require different kinds of educational institutions if they are all to be well served by higher education. We note also the great proliferation of specialization as society and its institutions become ever more complex; the notion that every college must strive to provide training for the whole gamut of specializations is becoming more ridiculous every decade. There is a uniformity of perception of mission throughout the world of higher education that has brought about deadening repetition of the same old curriculum on campus after campus after campus all across the land. We definitely desire to take the strongest stand against that situation.

There is the further consideration that, as a nation, we must experiment with a great variety of new models if we are to widen our opportunities to renew the vitality of higher education. That is the real purpose of the models presented here; they are meant to be suggestions for new institutional forms that may have decided advantages over the existing forms. They are meant to be experiments worth trying although some of them would be quite difficult to carry out because they imply considerable modification of interactions between institutions of higher education and society at large--interactions in which society has the larger measure of control. A trial of those would simply consist of creating the appropriate institution and observing whether the intended interactions did indeed develop.

There has been no attempt to coordinate the models, or to prevent them from overlapping, or to direct them to different areas. They were created by different teams of the project staff who were attempting to improve the effectiveness of higher education in what seemed to them to be the most promising direction. The results are a set of models, some of which overlap each other to some extent, some of which contradict each other to some extent, all of which try to deal with rather differently perceived inefficiencies of higher education, but which had the large practical advantage of permitting those of us who felt strongly about certain issues to pursue them without the constraint of having to compromise them with the views of others.

Nevertheless, their congruences certainly dominate their differences. It would be possible to assemble a self-consistent model which would include many of the significant features of all of them. Thus they generally emphasize students' determination of their own curricula as opposed to prescribed degree programs. They tend to downgrade grades and degrees; one, though, places considerable emphasis on certification (the Urban University). They tend to place great importance on experience outside the institution of higher education. They generally assume that higher education is for the masses with all the attendant modifications that that implies about entrance requirements, selection, and standards.

There are six models presented, although one of them is rather a model of a library than a model of a college. They were not constructed according to the original plan of combining promising innovations into self consistent and mutually supporting packages. As the project developed, views of the potential of various innovations changed and views of the appropriate role of higher education in society changed. We came to believe that major increases in efficiency would come with altering the role of higher education rather than with injecting innovations into its existing operations. Thus, in developing these models, we attempted to free ourselves of the tendency to accept the existing system unconsciously; we tried to regard our task as one of devising effective ways to conduct youths (high school graduates and dropouts) into satisfying adult roles rather than as one of fixing up various defects in the existing system of higher education. But perhaps it is impossible to do that because we usually came out at the end with large blocks of the existing system very much intact. That outcome is revealed by the shortness of the descriptions of the models. They tend to focus on the aspects that differ from the familiar model and to leave a great deal unsaid about how the model actually operates. The implicit assumption is that the omitted portions bear a close resemblance to corresponding portions of the existing model and operate much the same way despite the changes specified by the stated innovational aspects of the model.

Yet every one of the models has at least one radical or utopian or visionary component. The mission of the study almost demanded that that be the case. At any rate, it is a corollary of our original search for ways to bring about very large increases in efficiency; we could not identify any ways that seemed to have great promise without disturbance of the current format of higher education; substantial alteration appears to be required if higher education is to remain effective despite significantly reduced resources per student.

The model presented in Chapter 8 combines several ideas into a quite radical alteration of the present system. Its essential features are that practically everyone would go to college for one year away from home at public expense, practically no person would be a full-time student thereafter but would get his additional education as a part-time endeavor carried out at the same time he was pursuing his career, the great majority of persons would not ever complete four years of higher education in the aggregate, those that did would mostly do so late in life, degrees would tend to vanish from the scene. This model is intended to increase efficiency by spreading the more valuable benefits of higher education over the whole of youth instead of that fraction which would normally go to college, by having education motivated by perceived need or desire rather than by a certification requirement, by spreading a person's education over time in order to minimize his risk of obsolescence, and by increasing the relevance of a person's education. The chapter also contains a desperate effort to analyze the efficiency of this model so that there will be one place in the report which relates to one of the original goals of the study. The analysis argues that this model might conceivably double the efficiency of higher education.

Chapter 9, while very brief, forcefully prevents our overlooking the possibility that libraries - not colleges - may provide the more promising base on which to build higher education of the future. The greatest virtue of this mode of education is in its encouragement of the development of learning tools in a person so that he can design and carry out his own educational program at his own pace. It could be tremendously efficient if it were a sufficiently widely accepted mode of higher education that secondary education devoted significant effort to helping students acquire learning tools. Perhaps libraries, themselves, could be persuaded to develop, promote, and assist acquisition of such tools.

Chapter 10 presents a brief model that has essentially only one basic modification of the existing system. It would simply give everyone who attended college a degree which would be different for each person and defined on the sheepskin in terms of courses completed. The net effect on the outside world would be merely that an employer or other person interested in the qualification of the degree holder would not only read the front of the sheepskin to see what college issued the degree but also the back of it (the transcript) to see what courses it represented. The effects inside higher education would be quite far reaching and would stem largely from a shift of power from the institution to its students; that is, the control would become a marketplace kind of control vested in the customer. The goal of the institution would become customer satisfaction and that could bring about a very large increase in efficiency.

A fourth model, presented in Chapter 11, examines the potential of TV and computer technology to increase efficiency both by increasing class size phenomenally and by organizing knowledge in machines in such a way as to make it easy (efficient) for an individual to find particular pieces of knowledge that he needs, to explore limited domains of knowledge, and to skim through large areas of knowledge following a wide variety of strategies devised to illuminate a variety of facets of knowledge and a variety of connections between different domains. There are very large promises of efficiency here but no way to estimate the magnitude of some of them. What might be the benefit of extensive synthesis and integration of knowledge?

Chapter 12 presents a model which focuses on urban problems, continuing education, and career ladders. It attempts to organize careers rationally and to interlace education with progress in one's career throughout one's lifetime. It contemplates that higher education will move completely away from the dichotomization that separates preparation for careers from careers and separates youths from adults. It contemplates that careers will automatically include educational interludes which will be spelled out in job descriptions. Thus higher education would achieve complete relevance by becoming thoroughly integrated with the other institutions of society and virtually a participant in their activities from both the training and the research points of view.

The final model, presented in Chapter 13, considers the efficiencies that might be achieved by moving certain educational functions from the campus to business and government organizations. The advantages here are increased relevance of training activities and elimination of the necessity to duplicate expensive equipment and scarce personnel in educational institutions when perfectly satisfactory facilities and personnel exist elsewhere. The model is mainly concerned with the occupational training of professional and technical personnel, but taking the broad view of careers adopted in this report that could cover quite a large segment of the population.

CHAPTER 8

A MORE EFFICIENT ALLOCATION OF HIGHER EDUCATION'S RESOURCES

This chapter undertakes, with considerable diffidence, to satisfy the original goal of the study which was to devise a more efficient way of carrying out higher education. It will describe an alternative way of using higher education's resources and, despite our protestations in Chapter 3, it will attempt to make a rudimentary analysis of efficiency. On the basis of this analysis we shall claim that it is at lease plausible that the efficiency of higher education might be doubled.

We are convinced that the achievement of that kind of increase in efficiency requires a massive rearrangement, not only of what higher education does, but also, of how the rest of society behaves with respect to higher education. There are several such rearrangements described in Part II of this report; none of them are inhibited by any qualms about how society might get from here to there and the one we are about to describe in this chapter has the same defect. It does, however, combine several ideas that most of the project staff would agree upon as promising to be quite beneficial to higher education and it seems to lend itself a little better than the others to an assessment of efficiency. In any case, this is the only instance in which efficiency will be examined.

The arrangement we have in mind assumes that: (1) practically all youths (whether they have graduated from high school or not) would attend college, (2) they would attend for one year in residence at a college away from home, (3) practically no one would be a full time student after that one year--their remaining higher education would be scattered through their careers as a part-time activity mostly occuring at community colleges, (4) the part-time education and the first few years of work in the career of each youth would be guided by an alumnus of the community college especially assigned to him for that purpose. As a rough guideline we have in mind that part-time education might aggregate, over the lives of most persons, one to two years of full time education.

While we envisage that the great majority of persons would get their higher education in this mode of lifelong learning, we recognize that a few persons would most appropriately continue as full-time students after the freshman year. There are a few careers in which a great deal of preparation is required and in which the most significant work is done relatively early in one's life. The two outstanding examples are pure mathematics and theoretical physics; careers in surgery may not be far behind and society needs considerably more of them than it does of the other two. There are other careers (in music and art, for example) in which young persons often excel but they seem not to require long formal preparation in institutions of higher education. With very few exceptions though, we believe that the vast majority of careers would benefit by interlacing education with experience. Persons taking that route would begin their work lower on the career ladder but their positions at the end of ten years might be more advanced and should be considerably more secure as a result of their keeping abreast of advances in their fields by continued education. Standing in the way of this optimistic estimate is the tendency of employers to discriminate in their promotion policies against those who do not have degrees. That circumstance would especially make it hazardous for persons to take the proposed route (assuming they did not have to) if it were not done on a large scale; if most persons did it, there would be no particular handicap to be expected from this kind of discrimination. It is extremely important that this discrimination be eliminated as a matter of equality of opportunity, whatever our higher education system might be or become; large numbers of persons must get their advanced education piecemeal out of economic necessity and must not be penalized on that account.

In the scheme of things we have in mind, universities would become largely research institutes. They would have large freshman classes but otherwise, very small undergraduate student bodies consisting of those pursuing the few exceptional careers mentioned earlier and those intending to become research workers themselves; these latter would, therefore, be pursuing their apprenticeships in the kinds of institutions in which they will eventually work; they too might be mostly part-time students.

The typical youth would, then, spend one year away from home at college where he would, among other things come to at least an approximate career decision and then he might return to his home for a year or so as he began his career. His first step would be to associate himself with a local college which would take considerably more responsibility than it now does to launch him on his career. Primarily it would rely heavily on its local alumni to find a full-time or part-time job for him that can serve as apprenticeship training for whatever career he has chosen. (We use the word apprenticeship to refer merely to career-related employment and not to the restricted entry that has come to be associated with apprenticeship in craft unions.) A student's progress in a livelihood-oriented career would be determined by how his skills grow and how his employer (or a competing employer) moves him into more responsible work; grades and degrees would not have much to do with it and would presumably tend to vanish from the college scene. If his career was not livelihood-oriented then of course grades and degrees would have no bearing at all on success in the career.

The case for intermixing careers with education has been made many times and is appraised in Chapter 19. Its major advantage from the point of view of the rationale for the proposal made here is that a student will have some basis for judging what direction he wants his career to take and constructing his educational program accordingly. The objective is to make the educational program of each student fit his particular needs, for him to have a large part in its design, and for him to have sufficient first-hand acquaintance with the career that he will have a basis for good judgment about preparing himself for the particular variation of it that he wishes to pursue. Put another way, he must not be largely at the mercy of someone else's opinion about what he must learn to pursue his career.

Ralph Gerard raises the question of whether, in this scheme of things, community college campuses and classes would be necessary; particularly that question is emphasized by the desirability of individually prescribed curricula and by the promises of the electronic revolution. The latter is discussed in Chaper 11 of this report where we see something very different from the conventional campus and very few classes. But classes will not vanish altogether because there are economies to be had when people desiring to study the same material can easily come together to do so, because the natural stimulation of peers does assist some kinds of learning, because the practice of group endeavor and interpersonal skills often requires like-minded classmates, and because some learning is much enhanced by give and take with an instructor who is widely knowledgeable about the ramifications of his discipline.

Is it possible to find relevant apprenticeship part-time work in every community for every possible career choice? Perhaps not, but it should be possible to go quite a long way in that direction. Practically every community large enough to have a college also has schools, doctors, lawyers, engineers, businesses, public administrators, hospitals, public health officers, government agencies, banks, communications systems, social work and welfare activities, newspapers, theater (at least in local radio and TV stations), agriculture nearby, computer centers, laboratories, manufacturing establishments, and so on. These persons or organizations can often be induced to take on apprentices by making modest payments to them for the time they spend in supervision of the apprentices and for the facilities they must have on their premises to serve the apprentices. Indeed, it is not unreasonable to expect that they will welcome and value young people who are highly motivated, who have been perceptive enough to chose their own line of work, and are sponsored by alumni with standing in the community.

Alumni constitute a tremendous but little used resource for higher education. The model of higher education being proposed here puts great importance on keeping alumni in the college family by using them in several ways in the educational enterprise. They would help with teaching on the campus itself in the roles of lecturers and tutors; they would supervise apprentices in their places of business, and find places for other apprentices; they would serve as consultants to the college and the students in their own special line of work; they would host field trips to their places of work; and in general they would conduct students into their chosen careers. Their time will be far more valuable to the college than their dollars and possibly much easier to obtain.

Their most important function would be this: every student would have an alumnus specifically responsible for his successful entry into a career. Since graduates of community colleges tend to remain in the community, we may expect that there will usually be considerably more alumni than students in the community. Colleges would transform them from targets of the annual giving campaign and buyers of football tickets to shepherds of students. It is reasonable to expect that most of them would be delighted and proud to make that change. If recently founded colleges do not have enough local alumni to provide a shepherd for every student, perhaps they can adopt alumni of other colleges who have settled in the community. Perhaps in any case alumni of other colleges should be brought into the enterprise so far as possible so that the community resources available to students would have maximum scope and variety. Students from low-income families would be assigned to alumni from upper middle income families so that they would have good access to the know-how that gets one into careers with substantial potential.

One of the disadvantages cited with respect to any work-study plan is that part-time students would be competing in the labor market with the effect of depressing wage levels and antagonizing the regular labor force. Perhaps the alumni could sometimes soften that effect by creating positions as aides and assistants to themselves which would generally not be in direct competition with regular workers.

The participating alumni in the educational process would not only connect students to careers but they would connect the campus curricula to the real world and help give assurance to the campus that its education is relevant. Close collaboration of alumni in the educational enterprise might also be of substantial benefit to the alumni. They would be continuously aware of how the educational scene is changing, how current preparation of students differs from the preparation they had, and perhaps how some of their own skills and knowledge need upgrading so that they can continue effective pursuit of their own careers. The guidance of students into careers will also have the effect of causing them to give some thought to the long-range implications of various careers and perhaps broaden their views of their own careers and career options.

Of course, not every student will go back home to pursue his career. Often he will select a location which is more favorable for pursuing his chosen career. If a student from Kansas elects to go into forestry, then he will expect to seek his occupational training away from home and will select a college which can provide him a suitable apprenticeship. Not every home is near a college; those who come from such homes will be forced to find other locations at which they can pursue their careers and education.

The curriculum in the freshman year would be largely taken from the humanities and social sciences; it would be organized to focus on the basic decisions that young adults must make about how they plan to live. Courses and seminars would deal with the range of workable personal philosophies and their pros and cons, the way the world and society operate, the whole spectrum of roles one might assume in society, the whole range of occupational careers available together with their natural career ladders and the prices one must pay in labor, loss of leisure, neglect of family, ulcers, etc., to achieve various steps up the ladder. They would explore the advantages and disadvantages of separating one's career from his livelihood, the capacities and personality characteristics required by different careers, the range of tradeoffs available between material and psychic rewards in various career lines, the pros and cons of various life styles and particularly the compatibility of various kinds of personalities with conventional family living, group living or living alone. These studies would require that the faculty members concerned with freshmen be very thoroughly trained in couseling as well as in their disciplines and in fact that the faculty include a large complement of full-time counselors and clinical psychologists because it will be guiding important decisions that may shape very significantly the whole remaining lives of the students. The content of the curriculum would be alomst entirely taken from the humanities--philosophy, history, literature--but all having a distinctly sociological cast. Presumably it would be vastly more interesting than most students now find humanities to be because of the emphasis on their own personal decisions. The studies will require that we learn much more than we know now about careers and their interactions with personalities. The job market will have to be much more carefully and exhaustively appraised, extrapolations must be developed for projecting the probable future of existing jobs and the creation of new kinds of jobs. Theories must be developed for building generality and flexibility into career education so that individuals can adapt to changing conditions easily and confidently and willingly.

One criticism of this use of the freshman year declares that much of the goal should be accomplished in high school so that youths could get on with training for their careers in college. Our reply is that the goal cannot be carried out very effectively in high school because youths are too much under the influence of adults in high school--particularly parents. It is singularly difficult for parents to appraise objectively the interests and capabilities of their children; it is difficult for them to take sufficiently seriously the desires and inclinations of their children. Adults attach great significance to their own experience which is rooted in the past and which tends to discount intimations of the future. It is next to impossible in an adult-dominated environment for youths to get a realistic view of the full range of options open to them; they will mostly see a conventional, restricted range of conventional careers that appeals to the influential adults in their lives. To the extent that is true, society is robbed of its greatest opportunity to survive, that is, to adjust to changing conditions. Institutions of higher education possess two indisputable advantages as the place for young people to find themselves: (1) their research function gives them a realistic view of what is possible in the future and (2) the preponderance of youths on the campus tends to minimize the influence of adults as they make decisions about their philosophies of life and their careers.

Debbie Brown, a college student, correctly observed on reading a draft of this chapter that this year of finding oneself should not be arbitrarily inserted between secondary and post-secondary education. Youths become ready for that year at different ages; since the educational system is supposed to serve students, not constrain them, they should be permitted to undertake the year at the most opportune time for them. For some it may come before graduation from high school while for others it may come after they have begun their post-secondary education at their local colleges.

The funds to support all these freshmen who would not otherwise have gone to college would be supplied by society in the form of tax, gift and endowment revenue; these funds would probably be used to provide only the portion of student expenses required over what the student himself can supply but would definitely provide full living expenses for those with no resources. This arrangement, however, is not expected to increase the taxpayers' burden because the public subsidy would be removed from the other years of higher education; those years would be fully supported by tuition paid by the student from his earnings, mainly, but perhaps assisted by his family. Guaranteed educational loans must be easily available to all who wish to borrow funds for additional education. In a few cases in which society was particularly anxious to relieve acute shortages of personnel in certain occupations, tuition grants might be made to students beyond the freshman year. Substantial savings to parents are expected to result from having a sizable proportion of students living at home after they have been emancipated by the freshman year and from the fact that the great majority will have at least part-time jobs. The net effect then is to take away the public support of higher education that is presently devoted to subsidizing sophomores, juniors, and seniors, and instead to use those funds for supporting youths who do not presently go to college at all. Our financing proposal differs somewhat from that recently published by Tobin and Ross (in the May 3, 1969 issue of The New Republic) which would give every youth an equal endowment. Our endowment would only be large enough to enable the youth to attend college for one year away from home; it would be small for youths from well-to-do families, but would cover complete expenses including room, board and transportation for those that needed it. While it would normally be used for a year of college immediately following high school, it would not be forfeited if it were not so used; rather it would grow at the prevailing interest rate and could be used at any time later in life for any kind of advanced education.

Now we shall turn to some rough calculations of the costs and benefits of higher education and to an analysis of how the proposed arrangement might improve the efficiency of higher education.

We can not be mathematical about it but in a general way we think of efficiency as the amount of education imparted to students divided by the resources used up in doing so. Thus the efficiency of higher education as an institution might be doubled if it could be operated in such a way that the amount of education imparted to students could be doubled while keeping the amount of resources the same, or if the amount of education could be kept the same but the amount of resources cut in half, or if the amount of education could be increased by a third and the amount of resources decreased by a third. Doubling the amount of education might be accomplished by mainly increasing the amount gained by students who normally attend college or mainly by increasing the number of students; of course many analysts would argue that the latter should be counted as more efficient than the former because it is a plausible proposition that, beyond a certain level, the gain in education per unit of effort decreases as the level increases. But these are merely suggestive statements; we shall not actually be able to do any calculations of the kind indicated.

One insuperable computational problem has to do with defining *amount of education*. Higher education has a great many dimensions; there exist acceptable instruments for measuring some of them; there are none for others. We can, for example, obtain some kind of determination of the extent to which a person has become familiar with a scientific field such as chemistry; we have no device for measuring the degree to which his personal decision processes serve his personal goals. Certainly there are many chemists, for example, who are disappointed with their careers. Does that career outcome imply that their education was in any sense inferior to the education of those chemists who enjoy their careers? Perhaps it does; in any case it gives us a clue to one direction in which the effectiveness of higher education might be improved significantly; that is in the direction of counseling and career planning. But the point here is that some dimensions of higher education have no acceptable measures and the further point is that, even if they did, we have no accepted way of combining the different measures into a single quantity that could be called amount of education. So the idea of calculating efficiency or of determining that efficiency has been doubled is merely a manner of speaking; the conception is not going to contribute any precision to our discussion which will be purely expository.

What are the resources available for higher education? The largest part by far comes from students in the form of their time; time that could otherwise be devoted to productive work. The accompanying table estimates that to be almost half of the total resources; the estimate is made by first adjusting total enrollment to full-time equivalent students (that is, combining part-time students to form a smaller number of full-time students) and then arbitrarily counting their foregone wages as worth $3,000 for the academic year (9 months). Sometimes the point is made that if all these college students suddenly descended on the labor market they would depress wages to such a degree that they could not earn nearly $3,000.

U.S. Resources Devoted to Higher Education in the 1969-70 Academic Year

	Billions of dollars	Percent
Student time	17.9	48.0
Student living expenses	4.9	13.1
Tuition and fees	3.8	10.2
Federal government (mostly research)	3.6	9.6
State and local government	4.8	12.9
Endowment income and gifts	1.3	3.5
Other	1.0	2.7
TOTAL	37.3	100.0

True, probably, but not very relevant. As the wage structure of our society compensates persons with less than a college education and little work experience, $3,000 may not be terribly far from a reasonable measure of the value of their efforts. If society happens to be organized so that it is not capable of suddenly rewarding such efforts on a huge scale (say, for tearing down our obsolete central cities and rebuilding them in accordance with a satisfactory design) that does not mean that such efforts would be worthless (or that rebuilding our central cities would be valueless). Sometimes also the point is made that it may not be consistent to include student living expenses when a large sum for student time has already been included; if students were paid a wage for their time then they would pay for their living expenses out of those wages. We include these expenses for room and board of students who do not live at home because the expenses are a direct cost to parents of their children's college education. Actually only the additional cost over living at home should be included; we assume that the great bulk of it is additional cost and that an effort to adjust it downward would not be worthwhile in view of the roughness of our estimate of $3,000 for student time.

Actual cash output by students and their families for living expenses, tuition, and fees is estimated to be $8.7 billion in 1969-70. State and local tax revenue is the major contribution of society at large to public institutions; gifts and endowment income are also contributions of society at large in the sense that society gives up income tax and inheritance tax in order that wealthy individuals may give money to public and private institutions; these items of public support amounted to $6.1 billion in

1969-70. Federal support is almost entirely for research and graduate education.

All these estimates of resources were obtained by extrapolating data found in the Digest of Educational Statistics (U.S. Office of Education, 1969) and a report to the President of the United States entitled Toward a Long-Range Plan for Federal Financial Support of Higher Education (U.S. Department of Health, Education, and Welfare, January 1969) often called the Rivlin Report after Alice Rivlin, chairman of the committee that prepared it. The extrapolations were done by using projections found in Projections of Educational Statistics (U.S. Office of Education, 1969).

What are the benefits of higher education? The primary benefit is in the form of career training of individuals and certification that they have been trained. That is, higher education is mainly engaged in producing potential engineers, lawyers, chemists, psychologists, doctors, nurses, teachers, business administrators, farmers, musicians, and so on. It is interesting to notice that the present value of the incremental income associated with college degrees may be roughly equal to the total resources expended in producing the degrees. (The computation assumes that a B.A. adds an average of $2,800 per year to a person's annual income over what he would have earned as a high school graduate; an M.A. adds $4,000 per year; a Ph.D. adds $6,500 per year. Applying these figures to the 746,000 B.A.'s, 190,000 M.A.'s and 27,000 Ph.D's awarded in 1969-70 and discounting at 8% over lifetime income one gets $37 billion.) But that is just interesting, not especially meaningful especially as we get away from the idea of careers as a means for earning livelihood. The matter is complicated by the lower economic rewards given by society for work performed in their homes by women, by the fact that more able people tend to go to college and would tend to earn more than the average high school graduate in any case, by the discrimination of many employers against persons without college degrees when filling higher salaried jobs, etc. Also it should be noted that the calculation is very sensitive to the chosen discount rate of 8%; choice of 7% for example, instead of 8%, would raise the present value of the ostensible earning power of the degrees to nearly $42 billion.

Another benefit is received by individual students from courses that are not directly concerned with career training; most students seem not terribly keen about taking these but to the extent that they do their lives are enriched by greater understanding of the cultural milieu in which they live; that may reduce for some persons psychologically costly adjustment problems in later life.

A quite large benefit of another kind comes to most students who leave home to go to college; they must suddenly assume the responsibility for managing their affairs, their time, and their personal finances. They must decide how they are going to behave and what their value system actually is. Thus they get not only the benefit of escaping frequently stultifying constraints but of coming to grips, in a relatively sheltered setting, with all the resultant personal problems in the sympathetic company of a large number of peers who are struggling with and debating the same problems. Ralph Tyler notes, in this connection, that some youths, especially in low-income families, have very great responsibilities at home managing not only their own affairs but the affairs of the whole family. In any case, this relatively clean break with the home environment would give most students a potential for perceiving and choosing among a far wider range of options for careers and life styles than is possible for those who remain at home during their transition into adulthood. These considerations have led us to propose that public policy should make it easy for students to avoid spending their first year of college at a nearby community college while they live at home.

The direct benefits to society come from the research role of higher education rather than the educational role. If we confine our attention to the educational role, the benefits to society are indirect and take the form of increased intelligence in citizen functions such as voting, operating civic enterprises, carrying out cultural activities as well as the great benefit of having available a large pool of educated fellow citizens to man private and public organizations. These are the unarguable benefits; they may not be of great value in economic terms (the material quality of life in much of Europe seems to be comparable to ours and with far less higher education) but college education does indeed bring substantial enrichment to the lives of individuals and hence to their fellows. Nevertheless, many analysts would agree with Milton Friedman that it is not easy to make a case for the existing public subsidy to higher education; that is, it is difficult to justify society's spending $6.1 billion in 1969-70 to subsidize the education of those youths who attend college when they, rather than society, get essentially the whole direct benefit. As Friedman observes, few persons would agree that society should use tax revenue to finance more modern machinery for automobile manufacturers on grounds that society would receive such indirect benefits as greater economic activity generated by increased automobile business and greater tax revenue from automobile companies and from their stockholders. It is still more difficult to justify the subsidy to higher education when one observes that, on the average, those who go to college are more able and more affluent than those who don't; why should society go out of its way to give them an additional advantage over those who do not go to college? Certainly a strong ethical case can be made for devoting the public subsidy entirely to equalizing education opportunity.

We believe it is impossible to make a case for the public subsidy by arguing that society must have highly educated persons (such as scientists, doctors, lawyers, government and corporate executives, etc.) to keep our economy operating in good order. It would be possible to make such a case in an undeveloped country but in the United States there is no problem because there are quite enough families who are able to pay the full cost of higher education for their children and who are convinced that it is a good investment. We would get the highly-trained persons necessary to operate our economy without any public subsidy at all and it would probably be just as effectively manned as the most advanced European economies. The question then arises as to whether it would be optimally manned considering that very talented persons from lower income families would not be available and the answer is obviously not. But it is doubtful that we would be very far away from the optimum as things work out. Able persons who fill the responsible positions in our society come, by and large, from able and hence reasonably well-to-do families. The improvement that comes from adding to that cadre persons whose families could not pay for their higher education can only be marginal and not even slightly comparable, as a purely economic matter, to the public subsidy to higher education. The subsidy must rest on justice--not on economic necessity.

Turning completely away from economic necessity, let us recall the arguments of Chapter 4 to the effect that careers are not necessarily to be identified with livelihood. There is presently a great deal of confusion about this matter in the public mind mainly because the higher education community has been at considerable pains to try to persuade the public of the great economic benefit of its wares to society and to individuals. It is already a fact, though, that the primary careers of the majority of Americans are not associated with their livelihoods. And it is becoming evident to everyone that higher education cannot make good on the success that it claims for its graduates in the realm of personal income for the absurdly simple reason that there are more graduates than high salaried jobs. Higher education will have to admit that, for many persons, its benefits lie elsewhere and, since it will doubtless wish to remain a potent social institution, it will have to start emphasizing the gratifications of careers that are not livelihood-oriented. We can expect then that livelihood will loom much less large in the minds of college students than it does now and that would be appropriate to an affluent society. We do not mean to say that livelihood-oriented careers will not continue to be important; we are simply pointing out that they may cease being the overriding incentive for obtaining higher education; some educators will enjoy that state of affairs.

We have been exploring in general terms the benefits of higher education; now we look specifically at the major benefits that might be expected to follow from the arrangement proposed in the first part of this chapter:

1. Perhaps the largest benefit is the added flexibility and adaptability that society should have. Changing times and needs can have a much greater impact on the coming generation if practically all of that generation can deal intellectually with them away from the constraints of their homes and local communities. Today, at any rate, society seems to be suffering severely for its rigidity. It might also gain flexibility from the return of many youths to their homes where some of them, at any rate, might successfully bring new ideas to their parents and neighbors. It would thereby also reduce the "distance" between the university and the community.
2. Another quite large benefit revolves around the great attention that would be given to career choice with the promise that persons would find much greater satisfaction in their lives. It is not inconceivable that this benefit alone might go far to doubling the efficiency of higher education or rather it might be more accurate to say that there is little ground for doubting that expert individual career planning could be so excellent that it would double efficiency. And of course it must be made clear that by our definition of efficiency there

would be a gain if a natural-born wandering minstrel were diverted from his crazy notion of studying business administration into a life of panhandling as a wandering minstrel. Would it be possible to measure gains of this kind? Perhaps. We might later survey the general public to determine the proportion of people who believe their careers are significant and then compare the proportions of those who had received different kinds of higher education on the basis of that criterion. Getting at higher social productivity resulting from career satisfaction would be difficult, but crude estimates might be made by comparing the productivity of those who enjoy their work with that of those who do not.

3. Quite a sizable benefit should come from making higher education self-supporting after the freshman year. Students would have to stop and think about what they were buying whereas now there is so much subsidy that they tend simply to buy the whole four-year package under the comfortable presumption that it is a bargain. Full competition in the marketplace for dollars should prune ineffective courses and programs quite extensively.

How might this arrangement double efficiency? We begin a crude calculation by observing that in the 1969-70 academic year some 6 million college students (full-time equivalent of 7.5 million actual students) received in public subsidy about 6.1 billion dollars or about $1,000 per student. (We have left out the federal portion of the public subsidy because it is primarily devoted to research and graduate education while we are here considering primarily undergraduate education.) Among the 6 million students are about 1.6 million freshmen who use roughly $1.6 billion of the public subsidy. About 0.5 million of those freshmen are in junior colleges and the majority of them would need an additional subsidy for living expenses away from home; also a few of the freshmen in four-year colleges are living at home and would need support to live away from home. Perhaps $0.5 billion would cover the living expenses away from home of those freshmen presently living at home and unable to fully pay living expenses away from home. That makes the required public subsidy for present freshmen $2.1 billion.

Now we turn to high school graduates of 1968-69 who did not go to college in 1969-70; there were 1.3 million of them. Let us assume that most of them would need a large subsidy to cover not only tuition and fees, but also living expenses, perhaps $2,500 each on the average. That would increase the public subsidy by $3.25 billion and make the total public subsidy about $5.35 billion for the whole 1968-69 graduating class or about $1,850 per high school graduate.

Since our proposal contemplates that beyond the freshman year higher education would be fully supported by tuition (again omitting consideration of the federal subsidy to research and graduate education), this $5.35 billion is all that would be asked of the public. Hence, from the point of view of purely dollar costs, the plan might save the taxpayer about $0.75 billion of his cost of supporting undergraduate education if it were pushed to the limit to do so.

It should also be noted that the vast capital outlay programs for higher education could probably cease altogether. There is more than enough classroom and dormitory space available to handle the load under the plan proposed here which takes most students away from home for only one year and which stretches out the remainder of higher education over a number of years.

The cost of arranging work opportunities is assumed to be covered by tuition and is further assumed to be relatively small in terms of dollars. The supposition is that alumni would undertake a sizable responsibility in this aspect of education without charge. Thus there would be a substantial social cost in terms of the time of alumni but our belief is that the social rewards to the alumni would offset those costs and make the arrangement attractive to most alumni. We are thinking of rewards such as official recognition of the importance of their role in higher education by including them on the staff as career guides, opportunity for clearly meaningful public service, and incidental educational benefits accruing to continued association with institutions of higher education.

On the benefit side we are nearly doubling the number of high school graduates who get at least one year of post-secondary education; we assume the vast majority would get it at college though some noticeable fraction might prefer to go to a trade school. We assume that the effectiveness of the freshman year will be much increased for those present freshmen who are moved from home to college residence. We assume that a sizable fraction of those who would not otherwise have gone to college will be motivated by their freshman year to seek additional post-secondary education. These benefits alone may carry us a considerable way toward doubling the efficiency of higher education. To them we can add others that have already been mentioned: better career decisions, greater effectiveness of career education resulting from apprenticeship programs, greater effectiveness of career training and placement resulting from extensive collaboration of alumni, greater flexibility of society resulting from reduction of constraints on young people, and wider dissemination of the cultural models of the future which universities are continually developing. Perhaps the efficiency of higher education can be doubled at no additional cost to the taxpaying public.

In making this little calculation we postulated that essentially the whole of higher education was converted to the model proposed here. Of course that will not take place overnight, if ever, and the purpose of the postulate was merely to enable the calculation. The question is raised though whether a change of the kind proposed can occur without overcoming some large threshold. We argue that it can because without consciously focusing on the matter many of our best campuses are awakening students to the extremely wide range of careers open to them and to a new sense of community concern. Many of their students have in fact moved away from the traditional life style and either divorced their careers from their livelihood or changed their career choices from high status, high income occupations to occupations with a large element of community or social service (for example in public health, education, welfare, criminal justice, programs for minority groups, the Peace Corps). If this kind of thing can happen without conscious planning, perhaps serious attention could make it a very significant movement.

Our efficiency calculation also caused us to limit ourselves to the present national budget for higher education and attempt to achieve a large increase in effectiveness for the same amount of money. Of course that is an artificial constraint. If higher education has a new and larger role to play in increasing the flexibility of society, if we are truly concerned to equalize educational opportunity, then it would make sense for society to provide the $3.25 billion and perhaps more for those who do not now get to college in addition to the budget it currently provides.

CHAPTER 9

THE AFFLUENT LIBRARIAN

While students and faculties and administrators and trustees and legislators and alumni battle to shape the college of the future, some librarian may fall upon a fortune and build a far better model of a center for learning. He won't require exceptional imagination, just exceptional community support or a wealthy donor. The model learning center that results will be very different in proportions from a center developed from an existing college, and for many learning purposes it could be far better.

Consider, for a moment, a librarian's wild dream. His library is open around the clock, including its coffee shop, of course, although its excellent staff of research librarians and reference assistants are mostly on the noon to 8 p.m. shift. Automation will suffice for most functions at other hours and only minimal staff will be needed. Typewriters, telephones, tape and record players, movie and slide projectors, reproduction equipment, closed circuit television receivers, computer consoles, programmed learning facilities, bibliographical search routines, will all be available, perhaps coin operated, day and night.

Since this is just a dream, there will also be pleasant gardens for relaxation, numerous small rooms for conversation and for joint research efforts, comfortable chairs and desks and reading lamps, individual stereo and television consoles, a small drama/movie theatre, a few lecture and meeting rooms, and a supervised playground for small children as well as a children's library. Nearby, if not part of the library itself, there will be recreational facilities, a park, arts and crafts workshops, an art gallery, and a good international cafeteria. Naturally, special lectures, movies, artistic performances, seminars, courses, book readings, book reviews will be regular occurrences on the library schedule.

In the foyer of the library will be a directory of approved tutors, teachers, experts, editors, and critics, in any of several thousand subjects. The library will have adequate staff and orientation programs, however, to assist anyone in becoming an independent student capable of using library resources largely unaided. Also in the foyer will be a directory of examiners in various fields in case a person wants to test himself or obtain certification of his capabilities in any area. Again, however, the library will have automated facilities for self-administered tests in a vast number of subjects. Also, there will be a directory of educational and career development counseling organizations--corporations that guide people who want to prepare themselves for this or that career, and that assist them in finding employment opportunities throughout their lives.

An important feature of the library will be its clearinghouse facility which assists persons seeking others with similar interests to find each other and arrange joint learning ventures among themselves. The facility might take an active role in attempting to recruit a student or expert needed to fill out the roster of an informal group pursuing a problem requiring several skills or disciplines.

Although only a dream, surely this is not an exotic dream. Every librarian, every donor to a community center, must share some such dream. Nor is it an impossible dream. Such a library would cost less than any college, both in initial construction costs and in annual operating costs. There is no shortage in this country of the types of personnel or material such libraries would require. But who needs them? Who can afford luxuries such as libraries when we still face desperate, unmet needs for colleges?

What are the needs that colleges and libraries meet? Which needs are best served by the former, and which by the latter?

The needs of the very young, age 6 to 16, for intellectual excitement, self-directed learning, and cultural joys would be better served by such libraries than by colleges, though perhaps our primary and secondary schools are intended to fulfill these requirements. Similar needs for the older generations, over 30, and for the fully or partially employed of all ages, and for the exploited house-wife-mothers, and for those too poor to attend college, and for those unable to meet admission standards, and for the drop-outs and pushed-outs, would also be better served by the libraries. The needs of those who want to learn but don't want to be told what to learn, and when, and how, and don't want to sit in the lecture halls, could also be served best by the libraries. In fact, greater reliance on libraries as educational institutions would foster development of learning tools and learning skills in individuals so that they could become their own teachers; that is surely one of the loftiest aims to which education can aspire.

On the other hand, the needs of young people to get away from home could be better met by colleges. The needs for community living could be better filled at colleges. The need for supervision, discipline, directed goals, in pursuit of learning could be better provided by college faculties and administrators. The need of some kinds of learning for expensive equipment (computers, electron microscopes, etc.) would often be better met in universities or research institutes although it is conceivable that in some cases libraries could make satisfactory arrangements for evening use of such equipment owned by nearby corporations or government agencies. And last but not least, the person who is seeking degrees or credentials has no choice, currently, but to pursue this goal in our colleges.

Libraries and colleges each have their comparative advantages. The very young scholar, the old scholar, the part-time scholar, the casual scholar, and the self-directed or emancipated scholar, might all find their needs better supplied by the type of library envisioned. But the typical product of our current secondary schools might find their needs best served by colleges, as will all those who need credentials under our current credentialing system. If our secondary schools ever start producing independent, rather than dependent, scholars, and if our credentialing process ever becomes independent of colleges, we might find that it is our libraries, not our colleges, that need a dramatic increase in community support. By 1980 we may discover that it is our libraries, not our colleges, that are in short supply.

There are those who declare that learning is not a natural inclination for most individuals, that they must be prodded to learn, that libraries never have in the past and are not likely in the future to carry out any very extensive educational functions. Perhaps, but we very much doubt it, although it is reasonable to suppose that there may exist individuals constitutionally unmoved by the prospect of learning. We do not believe that arguments which rest on behavior in past generations necessarily apply to an age in which knowledge is both more interesting and more essential. We wonder how much of the alleged disinclination to learn may be the rebellious consequence of years of forced schooling. We wonder how much of it may be the result of the unpalatability of the traditional educational methods employed by schools. We also wonder whether the learning that takes place under the impetus of prodding might not be considerably less than the potential learning destroyed by prodding.

CHAPTER 10

A NEW CONCEPT OF COLLEGE AND UNIVERSITY ADMINISTRATION

In its most extreme form the concept would abolish all existing degrees and substitute for them one degree which might be called a "college degree." Everyone who completed at least one course satisfactorily would be awarded the degree and a certificate attesting to the fact. On the back of the certificate would be a list of courses that the degree-holder had completed. Those who now get Ph.D's and do post-doctoral studies would have quite a long list and of course the list would name the institution at which each course was taken if the student attended more than one institution. In its less extreme form the concept would merely add the "college degree" to the existing list of degrees and would award it to all who do not qualify for one of the conventional degrees. That would be a very minor alteration of the present system but we contemplate that it would be accompanied by a very major change of attitude on the part of colleges to the effect that the recipient of the degree was not a failure but had accomplished something entirely worthwhile.

That would be the surface aspect of the proposed new concept. The fundamental aspect would be transformation of institutions of higher education from agencies which process students to agencies which serve the needs of students as they themselves view those needs. In the past the student was, indeed processed. He was told what, where, how and when to do whatever needed to be done to be stamped "College Graduate" but this situation no longer prevails. The student is demanding, and receiving, some voice in the direction of his education. He is selecting more than ever before, the what, where, how and when to more nearly conform to his own desires and is obdurate in his demand for relevance. Consequently the input-process-output model is already giving way to a more realistic model in which the emphasis is on the student satisfaction rather than upon degree production. This is not to say that most of the usual courses and activities will not continue. The important change is in the concept of the college from one of education by processing to one of education through customer service. With customer (student) satisfaction the goal, arguments over educational objectives and processing techniques become irrelevant. Gone finally and irrevocably is the institution's position *in loco parentis*.

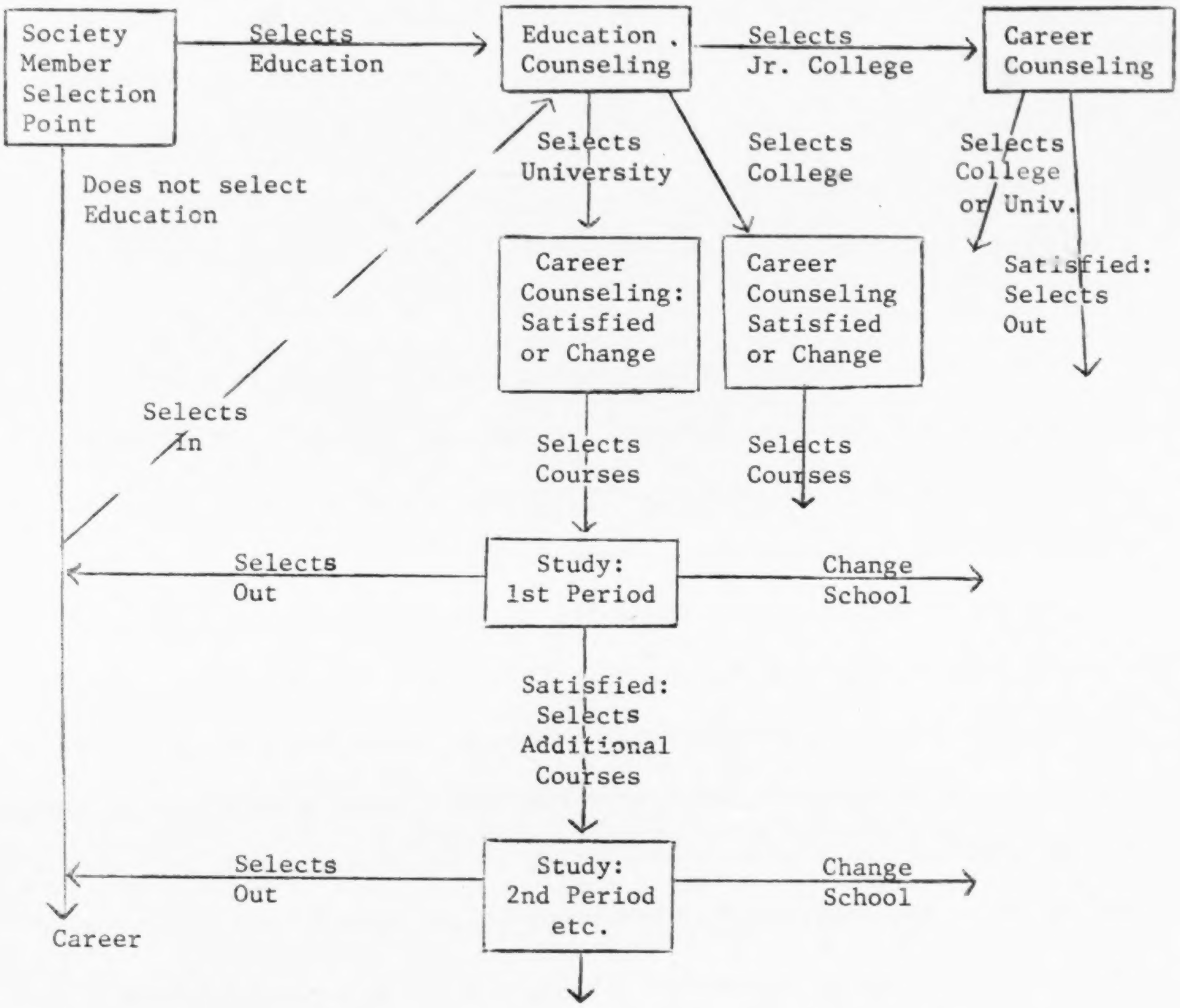
Conceptually the customer service model sees the institution of higher education as an organization whose efforts are directed toward distributing a product (knowledge), to a group of customers (students) in a manner that will provide current and future customer satisfaction. Although analogies are never perfect it may be helpful to observe that the model likens campus administrators to general managers, faculty to researchers and salesmen, students to customers and knowledge to products. The proposed customer service model leaves the college or university with a single simple goal; the satisfied customer. This is not to suggest that we are thinking of transforming institutions into profit-making enterprises which would resort to a lot of razzle-dazzle to sell students the wrong kind of education or sell them more education than they need.

Adoption of the customer service model will immediately alleviate the resource allocation problems inherent in the input-process-output model. Concern over the economic loss or gain to the individual as a result of his shopping tour through academia is unnecessary because if the customers are satisfied the resources have automatically been effectively allocated by a quite satisfactory criterion. There need be no concern with economic loss or gain to society if educational opportunity is truly equalized, for the customers are society, and all members of society will have been customers of education at one time or another. In the same circumstances, concern over who benefits most directly as a result of higher education, the individual or society, loses relevance. Lastly, quantitative measures of educational output would not be required because the educational effectiveness of an institution would be directly experienced by those most concerned and most able to control the success or failure of the institution--its customers.

Most basic to the concept of customer service is the proposition that students are the ones most capable of making decisions concerning their present and future given adequate information upon which to base those decisions. They are most capable because the kinds of advanced education suitable for a person depend critically on the interests and value judgments of that person; the weights that he attaches to various educational benefits are tremendously important factors in educational decisions pertaining to him and only he knows what they are. What is immediately implied for the institution is a new appreciation of the necessity for a continuous evaluation of the institutional offerings as they relate to the demands of its customers; a recognition that each student is an individual with distinctive needs, desires and demands; and a realization that if the institution is to survive, it must continually reallocate its resources in a manner that best meets changing customer demands.

The new model of higher education gets its impetus from student choice. As seen in the paradigm below each member of society is, at any given time, choosing to obtain or forego additional formal education. An institution, if it is to be effective, must recognize that it is a part of this selection process.

Paradigm for Educational Selection



If the customer is to be satisfied with his selection he must have had available to him a great deal of reliable information about various institutions and their programs and also information about all the probable consequences of his selection. And, in turn, the educational administrator must know the consequences to him and his institution of the selections made by each member of society whose selection may or may not impinge upon the institution. Such knowledge on the part of the administrators can only be obtained through rigorous and continual self-evaluation of the institution and its environment both present and future. It will become clear that what happened in the past may have no great bearing on planning for the future and that models based upon projection of the historical past must be abandoned.

Customer satisfaction does not mean, of course, that the student should be expected to select his path in higher education without guidance. Indeed a greater emphasis than ever before must be placed upon effective counseling. It is altogether possible that the wants of many students may be rather far from their needs. The institution must perceive those needs and attempt to persuade the student that his resources would best be devoted to meeting them; this should not be too difficult a task for an institution that specializes in education. Thus, counseling would not consist of dictums about what courses to take and when, to get credit of some kind or other, but rather counseling which says, "If you select this route through higher education this is the satisfaction you can expect." We may observe, for example, that the current abundance of the Ph.D's in some disciplines, the overabundance of secondary school teachers, the current lack of positions for aeronautical engineers and the ever increasing number of students seeking higher degrees were all predictable some years ago. Yet it is doubtful that students were so advised. Institutions of higher education will carry out fewer studies on the average length of time taken to obtain a Doctor of Philosophy and more studies on how many Doctors of Philosophy will be needed in the future when they become more concerned about satisfying their students.

Responsibility for customer satisfaction does not end when the student has finished his selected course of higher education. He and the society of which he is a member must remain satisfied with his selection. Dissatisfaction can come about through changes in society--no need for so many secondary school teachers--or through changes in the individual--a feeling of inadequacy or a desire for more knowledge. If the former, the student may rightfully hold the educational institution partly accountable that he was not warned. In all probablity he would go elsewhere should he choose to get further education and advise others to go elsewhere. In the latter event, the student may well choose to return to his original school for the additional work which will once again provide customer satisfaction. The essential thing for the administration, as well as the faculty, to remember is that the institution primarily exists to satisfy the needs of the present and future customers. It is not operated to build a reputation for the administrator, enhance the ego of the faculty nor even to satisfy "society." Students are the society with which they are concerned and the watchword is customer service.

What then is needed to provide customer service? First and foremost is a knowledge on the part of the administration as to what the customer wants and needs, that is, product selection. This requires a continuous evaluation of the institution and its environment, a diagnosis of the student needs, the planning for alternative courses of action (i.e., markets), the effective allocation of resources and the relevant updating of facilities and services. This should be the major responsibility of the administration. In order to accomplish this task the administration must have an effective program of institutional research which is not limited to the institution alone but encompasses the institutional environment as well. There must be a system of planning, programming, and budgeting which is sufficiently flexible to incorporate the results of his institutional research into a viable program for resource allocation and facility acquisition. And there must be a system that will collect, correlate and transpose relevant data into management information for decision-making.

Second, a continuous effort must be devoted to product improvement. Since the product being sold is "knowledge," this area is the province and responsibility of the faculty. Academic as well as educational research is essential to product improvement. No apologies should, or need, be made for faculty members who devote their time to research. They are equally as important to the organization as are the teachers (salesmen). Furthermore, research itself is a product and some customers will demand this product for their own satisfaction. All institutions, however, need not do product improvement nor offer research as a product. But each institution must to its own satisfaction determine the extent of its involvement in product research and development. Knowledge must not only be developed, it must be distributed as well, and each function is essential to a viable society.

Third, a continuous effort must be made toward quality control and this again is primarily the responsibility of the faculty--researchers and teachers alike. Quality of product must not be allowed to deteriorate under the pressure of consumer demands. Institutions offering a product of lesser quality will always exist and will welcome customers who are less discriminating. But, an inferior product should not be confused with a less costly product. A product may be of high quality and yet because of its relative size or composition be less desirable than one of equal quality but with more options included. That is to say, some persons are satisfied with a Volkswagen, others want a Cadillac but neither is of inferior quality.

Lastly is the salesforce. Since the foremost purpose of the institution is customer satisfaction, the administration must have responsibility for selecting those members of the organization who are to staff the sales (teaching) position. Persons to fill these positions should, of course, be selected with the advice of the department managers (deans). But the customer will quickly voice his approval or disapproval of these selections. Hence, the administrator cannot be expected to retain teachers who are unable to achieve customer satisfaction. Certainly good teachers should be rewarded just as should good researchers. But they must be considered as equals. A great orchestra leader is no less revered because he did not compose the music.

Pursuing this idea, perhaps the pay of teachers might depend to some extent on the enrollments in their courses. That should increase learning because, while students want to learn, they are also frequently not enthusiastic about actually doing much work in their courses. It requires a very stimulating, motivating professor to get real work out of them and hence to ensure that real learning takes place. When a professor can do that, the students are terribly pleased with themselves that they are working so hard and learning so much. The word will spread and the professor can be assured that he will have large classes (and a large income) next year. Poor professors will be poor.

Now what of the customer (student)? Will this change in concept leave him in utter confusion? Not at all, it does provide more freedom of choice but it also provides the student who wishes to conform to ancient practices a chance to do so. For example if a student wants the product that was previously labeled "Bachelor of Science in Electrical Engineering" or "Bachelor of Arts in Political Science" he can select the entire package. However as he examines the product in detail he must not only be free, but encouraged, to change his mind if he is dissatisfied. If he is dissatisfied with the quality then he must be free to move without penalty. Some customers will of course wish to sample many different products. The institution must be prepared at any time to examine the customer's selections and willingly negotiate if the customer desires place a single title, such as "three year program in quantitative psycho-cybernetics," on the package that he has chosen. If all courses have quality then any selected group of courses must have quality as well.

If the concept of customer satisfaction is to prevail, then the administration must be prepared not only to accept changes in course selection but also to encourage such changes when they appear essential. The question should always be, what did we do that the customer is unsatisfied? This is not to imply that all things must be offered to all students, in all schools. On the contrary, administrators must remain steadfast in their determination to maintain product quality and to offer only products for which they can assure quality; hence, they will unavoidably lose customers. The administrator must be equally aware, however, that the survival of his institution depends upon satisfaction. Products must change with changing societal and economic demands for accountability.

One of the most insidious contributors to the failure of management in institutions of higher education has been the conception that the institution processes students. Consequently, the generally accepted model for institutions of higher education is the classic input-output model that stresses the need for quantifiable outputs in order to determine institutional effectiveness. Since quantifiable data (beyond such rudimentary devices as number of degrees granted) have not been devised, the administrator can not determine either his own managerial effectiveness or the effectiveness of his institution. Further, he is unable, despite his best intentions, to measure the effectiveness of such administrative changes as he might choose to make. When he attempts to apply scientific management techniques to institutional operations, he finds that it is essentially impossible to make a rational model which will serve as the basis for his decisions.

The concept of the institution as a service organization will rescue administrators from this unhappy predicament. All the sophisticated techniques and devices of assessment that the business world has developed over the past thirty years will suddenly become avaiable to them. That might make a large contribution to the efficiency of higher education. However, we judge that contribution would be quite small relative to the contribution made by the service concept.

CHAPTER 11

U-NET - THE UNIVERSITY NETWORK

Modern technology presents us with visions of education possibilities limited only by our imagination. And other aspects of our world, including the current state of higher education, make it urgent that we strive to mold those visions toward reality.

U-Net is one such vision that bears directly on the two intertwined questions of education:

What is to be learned?

How is it to be taught?

THE U-NET CONCEPT

U-Net is a network of Learning Centers each consisting of various types of learning stations: devices such as television receivers, picture phones, teletypewriter, facsimile printers, film projectors, tape players, and computer-graphic displays, with which we are generally familiar. These learning stations are backed up by facilities and people for picking up information, storing it, and developing it into forms to be presented at learning stations.

Learning Centers come in various shapes and sizes, and are located at university campuses, public libraries, adult night schools, neighborhood recreation centers, and in homes. Virtually every home has at least a television receiver with push button responder so viewers can send immediate responses to a data center. Individuals may own or borrow other auxiliary learning equipment and lesson materials; the more expensive complex stations, such as time-shared computer terminals, are leased for private home use, or are loaned to qualified scheduled neighborhood groups.

Each Center is under the care of advisory and maintenance staff; the stations can be used without instructors, once users are qualified in their operation. Stations are of two basic types: "linked," electronically linked (operating in an "on-line" or interactive mode, or on a standby-fixed-schedule mode) to an Information Center, and "stored," that is unconnected to an Information Center and using films, video tapes, and teaching materials.

The network is "national" or "world" in the sense that it has the ability to transmit the same information over the entire nation, but it is not national in the sense that it operates only from a central broadcast station or information bank, or that it is under the control of a central office.

In fact, the configuration of U-Net (number and location of transmitter stations and receiving points) will vary from day-to-day, moment-to-moment, depending on schedule and demand. An education situation of world importance, such as a world congress of scientists, will be carried on one of the world or national channels. Courses or events of only local interest will be broadcast from local stations, over a local sub-net; a sub-net may be regional, city, neighborhood, or within a given building. Some networks are assigned exclusively to certain areas: i.e. a medical education network; a state-of-the-world network which gives access to a huge data bank containing information such as financial data, census data, ecology trends, public opinion, employment shifts, etc., might be operated by the federal government.

Some networks are operated by state universities; some are developed as private colleges in the form of community non-profit corporations, administered by a private staff, supported by tuition, and governed by faculty and students.

By virtue of up-to-the moment program schedules, switching and relay facilities, licensing and sharing arrangements, a subnetwork at one location or level can tune in to another, as suits its needs. Centers at various levels both develop their own programs, and make use of programs developed by others.

Some programs and lesson segments are put together at a major Education Materials Resource Center through the combined talents of artists, scholars, and information scientists, using information that has been reviewed, evaluated, and recast into a variety of forms for storage: magnetic tapes, films, slides. Other materials are prepared by the faculty and students of the local university. Program schedules and material indexes are automatically up-dated by computer, and can be requested at any computer-based learning station, and are displayed regularly over the special Schedule Display Channel.

Meanwhile, the steady rivers of day-to-day information on developments in science, history and current affairs are channeled through one of the Resources Centers; a materials preparation staff screens and assigns information to appropriate levels, much as current news gathering is done by today's wire services. In fact, U-Net, in addition to its own facilities, uses the information gathering services of such commercial organizations on an assignment or cost-sharing basis. However, instead of news editing, U-Net uses stages of interdisciplinary teams of experts and scholars to sort the deluge, add interpretation and background, and index it for storage. In contrast to the usual news service, the time scale of these operations, the depth of treatment, and the continuity and connection of current events to the body of past knowledge are considerably extended. While information about recent research by scientists and scholars is being integrated into the general body of knowledge, it would also be recorded as intellectual news without delay, instead of being written, edited, and published in a professional journal nine months later. This information is automatically stored in various types of magnetic memories, ready for almost instant presentation on demand, and in the forms requested to fit the needs of a particular user. When new information comes in on a particular subject, old information is automatically updated. Outdated information is erased or transferred to the history file so it will not remain handy in some journal on the shelf, to be passed on as current knowledge which will have to be later unlearned.

U-NET IN OPERATION

Let's visit one of the medium-sized neighborhood Learning Centers, this one at a local park. We follow a student through the informal browsing room to the scheduling desk, where he locates a computer-connected learning station. Quite at home, since he had the high school's introductory course on computer terminal procedures, he dials in the code for Job-Net Counseling, then begins to ask questions by teletypewriter. The screen glows with numbers and words, presenting him with an up-to-date listing of courses and lesson units related to the job of Park Ranger which he wants to try for next year. He asks, "Where are job openings likely to occur? How much will the job pay?" He asks for a summary of the skills and knowledge the job applicant is expected to have mastered, and an index of which lessons and in which courses these generally appeared. The student asks for a match of his past record with the job requirements, and he may even ask to be presented with a test of his capabilities on the spot. And if he passes the test (automatically verified by the data center) he can ask that his name and personnel record be automatically sent into the Job-Qualified File. This information will automatically be printed out the next time the Forest Ranger Placement Office asks for a list of new eligibles.

Other students interested in other jobs in the near or distant future, or interested in retraining and entering work-study arrangements with either local or distant employers, may listen to stored career recruiting presentations put out by industries; they may search several career profiles (sets of requirements, case histories, etc.); they may role-play over the learning station a specific career position in a preprogrammed business situation game to get a "feel" for the work.

Such automated counseling is sufficient to satisfy a large share of students. Others will ask for additional personal interviews with a counselor, specialist, or with an industry recruiter. This can be done over picture phone without the counselor moving from his office or the recruiter from his home base. If the student so decides, the recruiter can automatically have placed before him, on TV tube or facimile page, a detailed record of the student's interests and capabilities, so the interviewer may question him further about details.

At another learning station we see a mathematics student, but he is at the moment pursuing a political science question. Last week he heard a professor on his home TV receiver present a lecture on "A Theory on the Cause of War." Our student had recorded the lecture, replayed parts of it a few times to check his understanding of the historical events described, and then asked at the local Center for an index of current research. Now, a few days later, following a lead suggested by the work of a researcher on the other side of the country, he is using his mathematical skills, in the form of multivariate regression factor analysis, to search history--to explore the record of conflicts between fifty nations over the past hundred hears. He is searching thousands of facutal data--national characteristics and events--trying to find combinations that correlated with the outbreak of war; trying to find clues, economic or political indicators, that would have allowed these conflicts to be predicted. If his hunch is right, he may be able to disprove the lecturer's theory, which was based on a single-case historical example. If the student succeeds, he will put forth his own hypothesis about causes of conflict, which will automatically logic-screened by computer, and then stored in the file for review by an expert panel of scholars. If the student's findings are judged valid or at least useful, they will be indexed and passed to storage, where they will be available to others through U-Net, for educational or research use. Knowledge will have been moved ahead a notch without the delay of two years writing the old thesis whose fate, in any case, may well have been a forgotten file-cabinet grave.

In another room at the end of the hall, a group of local residents are in animated discussion with their city councilman. A student at a learning station console has just finished punching keys, and a diagram is sketched electronically on the large television tube around which the group is gathered. The caption reads: Street Rerouting Plan No. SRP218. The student takes up the lightpen and proceeds to change the design to a new street alignment which the neighborhood people want to substitute for SRP218, proposed by the City Engineering Department. At the touch of a button, the teletype keys begin spelling out data on the old and new plans: costs for land acquisition, construction costs, time required for construction, traffic load factor. As the student demonstrates, the neighborhood-proposed alternative will cost about the same and will solve the traffic problem just as well as the city plan, but in addition, it will be much more pleasing to the local community. Because the election will be coming up next month, the city councilman will doubtless be at City Hall early the next morning to present this new alternative to the City Engineer's Office.

At the learning station next door, a university faculty member is working because the station in his office is temporarily down for repairs. He is a professor of political science doing research by public opinion polling. He is sending a series of questionnaires to a sample of citizens throughout the country. He is interested in finding out not only the usual public opinion data. He will find out what they actually know about the propositions they are soon to vote on. More than this, using a new set of semantic differential type scales, he hopes to get an accurate idea of what people actually feel, even unconsciously, about these issues. Combined information about what facts people know, how they feel, and how they would vote, will give him a basis for recommendations on improving public understanding of current issues. When this professor finishes giving his directions over the station, he will pick up and go home. Those being polled throughout the country will, according to their convenience within the next few hours, switch their TV sets in a mode to be presented with the questions and give their responses. On the way in to his office next morning, the professor will stop by this Center and pick up the print-out of answers and the statistical analysis of the results. A few years ago this project would have taken weeks instead of hours, and would have been open to all kinds of data contamination.

Drawn by the activity, we enter a noisy room crowded with lively university students. They are preparing, we are told, to meet a challenge from a rival university on the other side of the country. This is to be a team competition in the form of an intellectual game to see which side can design for their area the more effective welfare program. Represented on each team, along with students who play the role of government planners and administrators, are a few real life welfare recipients and tax payers to represent their various interests and hence assure realism in the plans. One can pick up splinters of sharp arguments about welfare: "What are all the benefits to society?" "How do urban and rural living costs differ?" "What is the fair policy for slum clean up?" It's too noisy to get a clear explanation of what's going on; but the deep involvement of the students, the charts and documents, and the presence of several professors acting as advisors, all suggest the whole thing is a serious enterprise. Actually it's sometimes difficult at the Center to distinguish between entertainment and education.

We pass by the familiar independent study booths of language learning recorders and film-video playback consoles to end our tour at "the cave," one of the small all-purpose theater-like rooms with comfortable chairs. Ceiling, floor and walls can all be used as rear-projection screens, on which the user may paint with light, or project images: views from history, computer-animated diagrams, memory maps, whatever one might wish to surround himself with--silence, music or other sound. These may be arranged in programmed sequence or random order; physioligical monitoring devices such as brain wave, heart beat, skin conductivity measuring devices are available. The room has been found to serve a number of purposes, and new purposes are constantly being invented. Scholars, artists, scientists have used it as an induction catalyst. Students have found in it a device for auto suggestion, meditation, "mood making," and "trips" for with they had previously depended on drugs.

One large student project had the Cave scheduled as a Futurescope. For several weeks small groups had been meeting to develop scenarios and pictures of future worlds they thought could come about, based on their study of the past and present trends. Groups included students in many fields, from history, economics, engineering, psychology. Depending on his particular interest and knowledge, one member of a team will specialize on a detailed activity such as statistical forecasting of specific events, another will be a generalist, interested in broad social trends.

These futures will be "played back" in picture and sound, to a larger assembly, to serve as a focus for discussion. One of these "future worlds" will serve as the opening of a "futures game" in which players, locked into different real-life roles, will strive to choose actions to bring about better conditions. The game will be played at learning stations, through a computer, which will keep track of all the moves; the computer will furnish students with factual data and sub-models of economic and other processes through which they can examine its significance; the computer keeps a record and calculates results as the game moves on.

SOME POINTS OF COMPARISON

Clearly, it is not fair to compare an impressionistic fantasy with the present system which is alive and kicking; but it is not unreasonable to do so, for the comparison can suggest new approaches to "higher education."

First, it may be well to remind ourselves what the basic words we are using mean.

"Education"

Everyone goes on learning throughout his life--learning new things, unlearning (which is a kind of learning) old ones. We all splash around in a vast ocean of information--the angry ghetto dweller, the ambitious career climber, the unwanted pensioner, all go on learning until the end. Whether one learns to earn, or to spurn, or to burn, is another matter; whether one learns what he or someone else thinks he should "learn" whether his learning has value, whether he learns in the best way (with the least effort or cost or to the desired depth of understanding)--these are the questions of education.

"Education" as a social enterprise has to do with the ways of encouraging students to learn certain things, and by implication at least, with discouraging them from learning others. It is concerned with two basic questions which often merge: What is to be learned? In what ways is desired learning best accomplished. "Higher education" has been used to mean many things. Here we assume it refers to education for more advanced levels of knowledge. We assume the students (1) have already mastered a number of basic skills, (2) are capable of and should be given the right of self-direction, (3) may be more aware of their personal needs and of current social problems than those at younger levels and perhaps older levels of society. Most of these students fall into a few categories: young students searching for acceptable personal goals, for a path to financial independence, for identity and self-development; mid-career people seeking refresher study or training to further their avocations or occupations; other adults with leisure who are seeking self-development or ways to wrestle with broader problems of society.

The Network University

This is an impressionistic picture of an educational system that might be desirable because it could be less expensive and more effective in meeting our educational purposes by rearranging the resources we now have available. The term "network" is not confined to the electronics connections among various hardware, but is also meant to convey the vast array of other types of organizational and cognitive connections which the system involves.

Learning

When one learns, he receives information and sorts it: some information he rejects, sometimes unconciously; other information he stores, sometimes without being aware of doing so. And when one is called on, he responds with what he has learned: he sorts out, sometimes unconciously, what he can to meet the need, and he presents it. His learning is judged accordingly.

Efforts to explain how all this takes place, ranging from theorizing of the psychoanalyst to the precise descriptions of the computer-brain theorists are still far from their goal, but do suggest some guidelines useful for designing and judging the performance of a system for higher education.

Teaching

The role of the teacher is to facilitate learning. Whether he does so, whether he does it well, whether he imparts what is supposed or desired to be learned or something else--these are questions to be considered in designing and judging any educational system. The teacher's job is to diagnose what is wanted or needed, to select information that seems appropriate and to present it meaningfully; there is no way he can go beyond that (ruling out direct knowledge transfer by wire, pill, injection, or other means that may someday be possible). This is true whether the teacher is a kind, plump, good-humored professor or a sleek, new, computer-connected learning station. It is up to the individual learner to receive the information, to sort it, and to store it. In this sense all learning is "individualized."

So the task of education is to present certain information in a form not readily available in every day life. To be able to present, the teacher must first have been a learner. Particularly in the expanding subjects of higher education, where teacher and student are reaching to grasp moving targets, the teacher must continue to learn--in two senses: the subject area he is teaching and the reactions of his students so he can adjust his teaching to their abilities. U-Net or any other method of education presentation must also be a "learner" in these two senses, and thus, can be judged as to how well the learning-presentation steps are carried out.

Taking in Information

The information the traditional teacher takes in is limited by his individual intellectual abilities, screened by his culture and academic experience. His direct experience is limited by his ability to move over time and space, so he must rely on book-packaged accounts prepared by other individuals with the same kinds of limitations. He is limited in his time and ability to update information, and for various reasons he generally finds it hard to make close contact with his individual students and to monitor their attitudes, performance, and motivations.

Because of such limitations one should not be surprised if, despite the best intentions, the teacher finds himself dispensing stale theories, out-dated and unchecked information, and other kinds of intellectual junk to a passive, uninterested audience.

U-Net offers the chance to break through or at least stretch some of these traditional information intake limitations. It has at its disposal the powerful array of information pickup devices now used in the communications and research industries (and rather haphazardly in the education industry). These can provide a vastly more complete up-to-date flow of information into the education process. In a superficial way, radio and television have already been doing this, and have dramatically demonstrated how far behind the university is in preparing students for life ahead. To be sure, the decisions of where to place intake information sensors, when to use them, and what information to pick-up are man-made decisions, and thus suffer some of the difficulties noted in the following steps.

Sorting Information

The information--sense data, events, statistics, relationships--relevant to human existence is infinite, so we must rely on an extreme degree of sorting and choosing in presenting information for education before and after intake. There is always the danger one may pass over the gold and preserve the slag.

Some information is sorted out automatically by the sensors' inability to pick it up. In the human case, unconscious psychological blocks and biases may be additional barriers.

Other sorting is done on the basis of conscious decision. At present, the university instructor is left pretty much on his own, guided often by hand-me-down beliefs about what is and what is not important within the confines of his particular discipline. In addition, he is often forced by lack of time and storage space to discard ideas and information he knows may be important, simply because he has no room for them in his schedule, memory, or theory.

In U-Net much conscious sorting and discarding may be done rapidly and automatically, and under the guidance of interdisciplinary panels of experts. This procedure has four important advantages: (1) automatic checks for consistency and up-to-dateness of data, references, etc.; (2) balancing out the bias of any single individual; (3) recognizing a broader range of relevance (after all, life does not come in neat college-course packages); (4) keying information pick-up to preregistered needs of recognized problems, research projects, learner needs, etc., before they are stored in the computer data bank. As a result, a larger and more relevant selection of information may be admitted and categorized through the sorting process--information which, under the single-person, conventional approach, would be lost for education and research purposes.

Storing Information

The professor has his remarkable protoplasm memory along with his auxiliary ones (his personal selection of notes and books); U-Net includes these in its vast treasure house, and adds to them information from other individuals and information pick-up devices: data, "images," ideas stored on tape, film, core and disc memories. The potential advantages of information storage capacity, the flexibility with which information can be stored, and the speed of access to stored information from remote distances are dramatic.

Preparation

This is the special sorting process in which teachers select and organize information to be presented to students. In addition to what has just been said about sorting advantages and disadvantages, two points should be emphasized here. First, the U-Net system offers the teacher help in lesson preparation matched only by his imagination, for live or learning station presentation. The same tools used by the researcher--programs which allow one to select rapidly from a vast array of information, to reorder information into different kinds of lesson structures, using the computer to assist human induction in following out one's hunches; to be able to test the lesson and readjust it--such possibilities offer the instructor a new universe in which to work.

The second point is the obvious and perhaps more important feature of the U-Net system: to a large extent, the learner, with the counsel of faculty, will be organizing his own courses. Course materials will be available to him in lesson and micro-lesson-size units which he may combine in various ways to suit his own purposes, background, pace and learning style. He may work to educate himself to meet a clearly defined set of behavioral objectives, to satisfy specific job and certification requirements for which he can be automatically tested as often as he likes. And, in other subject areas he may follow his imagination seeking creatively new discoveries along unmapped paths. He may do both in paralell without confusing one with the other as has so often been the case in the conventional system. The same information can be packaged as courses of different degrees of difficulty (three units to be taught over ten weeks); or as lessons centered on a basic problem; or as indexed facts, themes, questions which the creative student may explore and correlate. He can adjust his pattern of learning to fit his abilities, schedules, and interests. He can combine lesson units in anthropology to slice into the past or build a picture of the future. Thus, he can fight his way over the arbitrary but formidable disciplinary and departmental walls which artificially constrain and misrepresent the picture of the world passed on to the students. This kind of seeking then would become a new individualized style of education where science and art cross to produce new learning and new knowledge.

Instructors here become advisors, demonstrators, partners in the quest for knowledge. These new roles will be demanding and uncomfortable for some who have long enjoyed one-up-manship in tiny domains of knowledge; it will be challenging for others. Perhaps this new process of natural selection among instructors in itself will be an important bonus of the U-Net system.

Presentation of Information

This stage involves, first of all, moving information from where it is stored to the student. The instructor moves his brain and the library moves its books across campus to the classroom at two or three miles an hour. U-Net can move information across the country at 180,000 miles per second.

Inside the traditional classroom, lecture-presented information is only a part of the lessons learned. Too often other lessons are learned; for example, that lecturers enjoy talking regardless of whether they are understood, that playing the grade-game and note taking--not thinking--are the skills to be developed. Sometimes these are balanced by more beneficial learning experiences; for example, that instructors can be fun and interesting, or that group discussions can be exciting and stimulate new thought.

Because U-Net will not require the legions of live presenters forced to act in a role for which they are usually not trained or talented, it may be more selective, using the more effective ones. The need for personal contact may be more adequately filled in individual and small-group meetings. Meanwhile, U-Net's rich variety of materials under the control of the learner are an incalculable advantage.

U-NET IN PERSPECTIVE

The University Network seems to fit easily in with the slogans, ideas and goals forward-thinking educators have been saluting in recent years:

Individualized instruction

World as a classroom and school without walls

Learning by doing

Greater freedom of choice for students

Intellectual exploration

Learning by discovery

Interdisciplinary study

Flexible scheduling

The use of humans for what humans can do best

Equality of opportunity

Closer integration between counseling, education and occupational opportunities

Learning to learn

Programmed instruction

Lower instructor-student ratios

More efficient use of resources--capital, equipment, labor and above all, students

Many of these have been under exploration in piecemeal fashion within the current system, particularly at pre-university levels. But it has been the university students, rather than the educators, who have been pressing for the change that may outweigh all the others: they want education with real-world relevance; they want to break out of what they feel to be the busy work of their academic detention camp; they want to get into the action. It is here that the U-Net potential stands out.

Traditionally, education has been run as a sort of intellectual soup kitchen whose job was to ladle out a staple diet of society's cultural heritage. But the cooks pay little attention to what's already in the bowl, or what kind of a diet may be called for in the case of one individual or another.

More recently, when we seem to be bucking hurricane winds of change, education has been likened to an autopilot or other cybernetic mechanism: when society begins to drift off-course, signals are sent to the nation's schools, which then set about making adjustments, pouring out the kind of people needed to get us back on course. If this idealized analogy has any use, it is probably in raising a number of questions: How well does this mechanism do the job? Are the right error signals coming in? Why does it respond so slowly? Who, if anyone, set the course on the education autopilot? And, where are we now?

The view of Earth from the Moon, the population bomb, the threatening refuse and pollution tides, have suddenly brought us face to face with the reality of Spaceship Earth. We are coming to realize that, for all practical purposes, the human race lives in a closed system. Unless we make wiser use of our limited provisions, keep our ship in good condition, learn to handle the frustrations and mutinies among our crew, we may all go down together. Given the traditional, separated disciplines stamped out by university education, we cannot hope to handle the job. We are handing students an old tool bag and should not be surprised if crow bar and box wrench do more harm then good in our efforts to fine-tune the intricate machinery of society in which we are now racing ahead.

In this light, the study of History becomes not a matter of dates and events and one-man guesses, but an attempt to create a comprehensive flowing picture through time so we can more thoroughly perceive where we are now and where we may be heading. It is a study to be pursued with the active participation of the economist, anthropologist, psychologist, political scientist, mathematician, taking advantage of whatever information and tools they can invent that will help do the job. Instead of political science being the study of the formal structure of one type of government or another, it becomes a study for diagnosing the complex human needs and social aspiration and finding new paths toward social survival and well-being.

The growing signs of revolution, crime, disappearing resources, degrading environment are badly outrunning our traditional social management style, and the finishline is coming up fast. Nothing less than a consolidation of all the talents and information held by the economic technologist, achitects and engineers, biologists, lawyers, communication specialists, and others will be able to provide the materials from which the needed lessons can be fashioned.

This realization has already begun to produce entirely new professions to join the *battle line--ecologist, urbanologist, systems analyst, information specialist.* But the means of effectivly training them are still largely lacking. Moreover, since the success on these new fronts will depend ultimately on a broad base of public support, the public must have good understanding of the problems, goals, and means required to deal with these questions.

U-Net is particularly well-suited to the tasks because of its ability to bring together from across the world a vast array of current information, to sort it, and to make it quickly available in many forms anywhere in the country. These are the characteristics that have already made its components, particularly the computer and television, indispensible to research in fields from medicine to behavioral science.

By being able to teach in new ways, U-Net gives education the power to operate at a new level of relevance where the basic questions of education merge: What is to be learned? How should it be taught?

CAN WE AFFORD U-NET?

Many in the educational hardware business make it seem we cannot afford to continue education another semester without their product. Others will argue that the costs of U-Net place it beyond serious consideration, basing their case on limited comparisons with the budgets of primary and secondary schools.

What would a U-Net system cost? There is no shortage of cost estimates: $50 and up for TV receivers; $100 to $50,000 for TV cameras; $500,000 for TV stations,$5 per hour for a cable TV channel; $6 million to wire up a 100,000-home city; $5 billion to spread a 20-channel cable net over half of the homes in the country; $5,000 to $15,000 for a time-shared computer station; $0.16 to $2.00 per student hour for operation of a computer-based learning station system; $200,000 to $2 million for a computer; and so on. Then there are the costs of maintenance and operating staffs, and the costs for preparing lesson information and up-dating it over time. Figures are also available here: film production--$200 to $1,000 per minute of film time; programming staff--$50 to $100 per hour, and so on.

But estimates, hard or soft, mean little until they are put together in the context of an operating system plan; even then they cover a broad range. Costs (generally figured on a per student basis) will depend on the extent to which lessons are distributed. In one case, it may be to a class of 30; to another, to a class of 300,000. Beyond such considerations, the problem of estimating costs has become enormously more difficult since educators have joined the popular cost-benefit game. The game involves adding up the costs and adding up the benefits of various alternative systems and then selecting the system that seems to offer the cost favorable ratio for a given set of objectives. Despite the seeming rationality of the process, there are problems. First, one is immediately hung up by the problem of specifying objectives. Then, he is mired in the difficulty of measuring costs and benefits or achievement toward these objectives. If, as is often the case, one takes into account only the costs or the benefits that can be easily measured, he may be completely misled, since these may be the least important ones.

Improvements in higher education may indirectly bring about many diverse benefits: increasing motivation, efficiency in learning, cutting down on campus disruption, changing attitudes leading to the conservation of natural resources, decreasing welfare costs--indeed preserving the very ability of our democracy to function and survive. These may be among the more important benefits and should not be ignored. And if our present system of education acts to bar us from such benefits, the loss of the benefits should be considered as costs. The fact that these general effects may be difficult to measure is no excuse for disregarding them. Many of these can be at least specified and used in system comparisons to a greater extent than has been the case so far.

Cost benefit ratios for education are most easily specified in terms of a set of clearly defined objectives, such as learning basic skills or qualifying for a given income level or professional class. But we are being swept into a future where automated production, Spaceship Earth with passenger crowding, endangered domocracy and conditions we can not yet imagine almost certainly await us. It could turn out that the greatest benefit of a U-Net system, (or penalty of our present system), is in its ability to help us meet change.

Finally, estimates of education network costs must take into account the fact that a multi-channel national cable network will serve many uses. It will be a partial substitute for air travel and highways, it will improve organizational and communication services, and so on. Education will be but one activity sharing the costs. One estimate has put the savings a cable network could produce in various services at more than $50 billion annually; an estimate for franchise tax income that might flow into government treasuries was $200-400 million for New York alone. Such figures, to say the least, are vague; and there may be unexpected costs from the network, which will balance them.

Clearly, there are ample cost questions to occupy communication economists for a long time to come. Probably the best one can say about U-Net at this point is that it should not be disqualified from education on cost or cost-benefit grounds; indeed, it could eventually allow us to stretch our education benefit dollar great distances, even over the horizon.

OTHER PROBLEMS

Cost is by no means the only or the greatest problem to be struggled with. The vision of widely available time-shared-computer learning stations, feeding in and drawing out information about students' backgrounds and records of performance, raises the important problem of privacy at a time when privacy is becoming a vanishing personal treasure. The problem, however, is already being tackled on behalf of other uses of shared data processing systems and it appears that encoding, machine design, and specified use patterns can indeed, safeguard privacy if planned for and used.

The problems of organization and administration of higher education, today viewed with dismay and sometimes despair, will certainly not disappear with U-Net. They could get worse, if only because of the additonal stress of change. On the other hand, it is quite possible that U-Net may be more adaptable to management concepts and may be more adaptable to new management concepts and may eventually become more efficient and more responsive to needs than we can forsee.

To some, U-Net may call forth the image of "thought control," given the power of such a medium. But in a very real sense this is what we are already saddled with: we make only a few commercial television channels available and make them accessible only to those of substantial wealth. Indeed, the fact that U-Net will remain under local control (made possible by the low-operating costs of Cable stations) and will be able to tune into other subnetworks will break down thought control. One could argue that the shared values, myths and "selective programming" or censorship which many believe are necessary to bind a nation together, may be undermined by the wide freedom of choice U-Net can make available, but this would be counter to our democratic ideal.

There is also the problem of instituting change. When faced with the vision of a fully established system, the changes necessary to get from "here" to "there" appear staggering. They are changes not so much in technology as in attitudes and roles of individividuals involved--which means large numbers of people from many segments of society. But, in reality, the system will take form slowly, unevenly; indeed, it is already well underway. This perhaps, is the greatest problem of all; it is by no means obvious that what is developing will be suitable, let alone efficient, for higher education's use.

Most of the pieces of hardware and software that make up U-Net, as described above, exist and have been used, at least, in experimental form. But, for various reasons, many are not matched for compatibility that will allow them to be used together; and they still remain unevaluated, so far as giving us the information we need to design an efficient system.

Meanwhile, the cable television network, emerging after a hard birth, is already growing up deformed. Small fragments of CATV net are being strung out by the thousands; four thousand are operating or now under construction, applications for thousands more are waiting approval. Intricate business negotiations have tied together suppliers of electronic equipment, program producers and network operators, without reference to educational standards. Different fragments are being developed and bought up by groups driven into heavy competition by the tantalizing possibilities of great profits. The question of who is qualified to do what seems to be irrelevant.

CONCLUSIONS

Three types of recommendations flow from the present situation.

Keep the Options Open

Federal, state and local agencies of government should act to see that options are kept open so that a U-Net system will be allowed to develop its potential. The present trend of piecemeal development could lock U-Net in a prison of hardware mismatch or rigidity, blind legal corriders, costly business arrangements and half-baked educational materials, all built by the hard-driving commercial race for profits. We should not forget the lesson of commercial television: without government regulation the public will be denied a voice in one of the most powerful social instruments.

The problem is not so much to push for the development of a U-Net system, so much as to slow development until the necessary information can be assembled and plans laid for its orderly development.

A Coordinated Program of Studies

Many aspects of U-Net seem to raise problems, which should be addressed in a series of coordinated studies. The nature of some, but not all, of the problems are familiar to those who have worked with large integrated systems; e.g. aerospace: establishing consistent hardware standards, assessing of the capabilities of future hardware (e.g. laser transmission), the design of alternative system modules and systems costs studies.

Other aspects to be studied are less faimiliar: legal problems (copyright, leasing arrangements, licensing questions); the design of alternative organization forms and individual incentives for change; and fundamental questions about the goals, utility, and funding which U-Net will open to new dimensions.

Curricular Materials and Lesson Preparation

In this respect, U-Net offers a whole new universe to explore. The newer component of the system (the computer-based learning station) seems to be well ahead of the older one (instructional television). Though begun 20 years ago, college level television has only a few cases, progressed beyond grinding out food-for-thought in its least palatable form, canned lecture. The progress in computer-assisted instruction may be partly attributed to the fact it is prodded along by the computer fever, hardware entrepreneurs, or by the quality of its research personnel. The snail's pace of television material development may, among other things, have been caused by the methology of prohibitive cost, and departmental barriers in a university that separates scholars from media. In any case, material development need not wait. The demand is already here and will not be changed greatly by media technologies.

Commercial interests are already pushing into the field. One problem is that since TV and computer-use materials will represent a substantial investment, once created they are likely to be pushed into use, and stay there, whether they are of first class quality or not; further material development will thereby be discouraged.

What is called for is a series of Material-Development Resource Centers, combining the talents of media artists and scholars, and offering scholars help in mastering the medium. Educators should begin to capture the medium, rather than be captured by it. Elements of such a resource already exist in current organizations and can be coordinated through a sharing organization, but they leave much to be desired, particularly since basic academic disciplines are not represented.

CHAPTER 12

THE URBAN UNIVERSITY

In 1960, 70 percent of the U.S. population lived in urban communities of more than 25,000, and 63 percent lived in communities of more than 50,000, covering 9 percent of the land. One prediction is that by 2000, 90 percent of the population will reside in large urban areas, and one-third of the population will live in ten super-metropolitan areas, such as the Atlantic Seaboard and the Southern California Coast. In the next 30 years, if population predictions are correct, the nation must double its present physical facilities. If this build-up proceeds in the haphazard pattern of the past, cities may become unfit for what we now consider a decent standard of existence.

If we are to avoid urban catastrophe, a new method of dealing with urban problems must be devised. Clearly, one thing that is needed is a kind of clearinghouse for urban problems, where integrated solutions can be considered, taking advantage of whatever tools and concepts are relevant from various disciplines. This is in sharp contrast to the compartmentalized approach to urban problems today. This integrative function is one of the basic purposes of the Urban University, whereby solutions to problems, such as housing, health care, or transportation, would take into account other areas of urban life affected. For example, a student in studying urban health would also consider relevant problems of poverty, transportation, communication, noise, pollution and so on.

City-dwellers faced with the myriad of urban problems do not seem to be moving toward collectively demanding solutions so much as toward individualism, perhaps in an effort to preserve psychological distance, as physical distance among people in cities continues to shrink. The Urban University would help to overcome this isolation by acting as an urban center for all people in the community, helping them understand their neighbors, their cities' problems and the opportunities for solving them. Thus, one goal of the University would be to develop and maintain a broad base of public understanding and a readiness to support constructive programs.

And just as important, the Urban University would strive to provide a program for the whole urban man; it would serve as a center for knowledge and learning about broad and specific, practical and cultural aspects of urban living. Another goal of the Urban University would be to produce a new breed of trained professional and para-professionals, both as generalists and specialists, for the various operations needed to sustain and improve city life. Training would be problem-oriented and include internship programs operated in collaboration with local government and business.

Several particulars point up the difference between the Urban University and the present-day traditional university:

1. The Urban University would be a tax-supported institution open to all residents of the urban area. There would be no admission requirements.

2. There would be no grading at the Urban University. But for technical areas, certification standards would be established for individuals who wished to be licensed.
3. All programs at the Urban University would involve work/study on a regular basis.
4. The Urban University would be the central repository of urban knowledge, government and business would use it as a primary information source. It would keep records of developments in various areas of urban study and organize, update and make it available, via computer, to government offices and relevant professional and community centers.
5. Applied research in urban problems, as opposed to "pure" research done in traditional universities, would be an integral part of the Urban University.

H.L. Hodgkinson has summarized much of the justification for the Urban University. While noting the increasing interest in urban problems which is characteristic (to some extent) of American higher education, he points out "higher education is fundamentally a middle class institution and has little dedication to those who are simply poor", and

> ...existing programs with an urban connotation are still relatively small and do not represent total involvement on the part of the institution...an urban university (which now seems to be a contradiction in terms) would fly in the face of the established values and reward systems in the existing universities...It would be concerned for those programs and skills which had immediate value to the people in the city rather than those which had no immediate utility. It would be inter-diciplinary and problem-centered. Certainly the Ph.D. degree as currently understood would not equip one for either teaching or

> doing "research" in the urban university one could envisage for the future. It can be said that at the moment no university exists which by its structure seems deliberately designed to deal with the problems of the city.*

One basic feature of the Urban University would be the career ladder, a concept spelled out in detail by Pearl and Riessman in New Careers for the Poor. At present, professional status is attained only by first completing between 5 and 8 years of college. This requirement for training prior to entrance into a field effectively eliminates almost all of the poor from eligibility. Under the career ladder concept, one may move through a sequence, beginning as an unskilled aide, proceeding through an assistant (2 years of college equivalent plus experience) and finally, to professional status. In this way, the poor can aspire to careers formerly closed to them.

Through the career ladder, the individual may enter any profession and be trained in any specialty or specialties that comprise that career. Moreover, because each career is broken down into various levels, each individual can also choose how high he wants to go in his profession and he can get off the ladder at any rung. Regardless of which rung he trains to, he can be licensed for that level and is ready for employment. Thus, the career ladder concept requires the creation of new job categories. This means there must be detailed studies of the specific duties and functions that professionals perform to locate the most suitable points of entering the career education process. For example, in social work, rather than employing more welfare workers with advanced degrees to administer to the poor, new jobs would be defined in welfare administration which could be carried out by recipients themselves. (See Appendix A for illustrations of three career ladders.)

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* Hodgkinson, Harold L. Institutions in Transition, A Study of Change in Higher Education, a report prepared for the Carnegie Commission on Higher Education, 1970.

The faculty in the Urban University would differ greatly from the faculty in conventional universities. They would be recruited less on the basis of academic degree than on the basis of their knowledge and experience in urban affairs. An individual who has been involved in urban government for many years may be a valuable faculty member, whether or not he has a degree.

SOME BASIC FEATURES

Urban Science

The Urban University would be dedicated to the development of Urban Science, a body of knowledge which would seek to articulate and manage the economic and social forces of the metropolis. The primary concern in the development of Urban Science would be the well-being and betterment of the urban populace.

Free University

The Urban University would be open to all residents of the metropolis free of charge and with no admissions restrictions. In this way, the Urban University would expect to eliminate not only racial but economic discrimination.

Governmental Function

Some services, e.g. licensing, normally performed by city government would be assumed by the Urban University. The University would train Urban

(Civil) Service employees at all levels; its director, associate director and assistant director would hold voting seats on the governing body of the metropolis. While the University would have a hand in running the city, nobody from the outside would control the University except that the governing body of the metropolis would participate in making its policy; it would be administered by its directors, faculty and student body.

Licensing Function

The Urban University would be the official licensing arm of city government in specialties in which the University offers training. Licenses would be granted by the University upon the recommendation of its various schools and colleges. Attendance at the University would not be a prerequisite to licensing, but the applicant must qualify by satisfactory performance on practical and theoretical examinations. Licenses in most specialties would be renewable every five years through passing a test. In order to continually bring licensing standards up-to-date so that they reflect the latest scientific advancements and in order to make licensing requirements consistent, licensing criteria would be established by the University's research departments and it School of Urban Review (discussed later) in cooperation with other branches of urban government.

Applied Research

Applied Research in urban problems, as opposed to "pure" research performed in traditional universities, would be an integral part of the overall program approach of the Urban University. The University would be totally committed to the solution of real rather than theoretical problems.

Work-Study Orientation

Every program in the Urban University would be designed with requisite work-study experience from the very beginning. Such experience would be in addition to the practicum and internship requirements in many programs which would actually be designed to provide intensified work experience with minimal study. Work-study would combine work experience and classroom instruction.

Center of Knowledge

The Urban University would be the primary and most extensive repository of urban knowledge and would be engaged in gathering, classifying, and disseminating urban knowledge in all areas.

Integration of Governmental Structures

Certain governmental structures would be integrated into the framework of the University. The University Teaching Hospital, for instance, would also serve as the Urban General Hospital. The University Judicial Center would house the Urban Court (Municipal) and the Court of Appeals. Advisory Board members in Building Codes, Transportation and Law Enforcement agencies would serve as visiting faculty with offices at the University.

In this way, the University would bring together all parties in relationships; doctors, patient, student in medicine; judge, defense attorney, client, prosecutor and law apprentice in law; contractor, journeyman, apprentice and architect in building. Heretofore, such programs have been limited to the medical field.

STRUCTURE AND FINANCE OF THE UNIVERSITY

Directorship

The chief officer of the University would be the Director. He might be elected by the Faculty Senate for a term of five years. He would not be re-elected to a consecutive term. Although he would have the power of final decision, he would be responsible to the Faculty Senate in all matters.

The Associate Director of the University would be privy to all University business and have an influential voice in all decisions affecting University policies. He would be elected by the Student Body for a term of two years.

The Assistant Director of the University would be elected by a combined vote of the Senate and the Student Body for a term of five years to run concurrently with that of the Director. He would be the liaison between the Director and the various Schools and Colleges.

Finance

The Urban University would be basically a tax supported institution. Support for each college would also be supplied, in part, by individuals who have attended the college. The actual amount of support from each individual would be determined by the number of years he spent at the college or under the auspices of the college, the cost of training for his course of study, and his annual income. Students, who need it, might be supported by a system of loans.

UNIVERSITY PROGRAMS

The Current Events Program

The University would urge, but not require, all students to participate in the Current Events Program. It would be designed to develop an intellectual awareness of urban and world problems related to the various areas of study before an individual decides upon his course of study. There would be no career ladder for this program.

The program consists of the following courses:

Introduction to Current Events. This course would be a preparation for "current events" and especially recommended for entering fresemen who have not completed high school.

Current Events. Familiarization with world events, ranging from politics to science, through reading newspapers, periodicals and news-reports. The bi-weekly Current Events Seminars would supplement the program by giving Current Events students a forum for discussion.

Comparative Events. Research study of specific developments in recent history would be encouraged in an effort to gain insight into historical perspective and interpretation in economic and social concerns. A monthly Comparative Events Colloquium would promote student collaboration in researching topics and presenting papers.

Analysis of Events. In the final quarter of his freshman year, each student would present a paper analyzing a current or past event. This paper would be used as the basis for deciding which freshman would be awarded tutorials.

Self-Development. The University would provide personnel and facilities to enable any student (or group of students) to pursue any topic of interest to him (or them). Individual counseling would be included once a week.

Special Tutorial. A Tutorial on a special topic such as verbal skills, reading skills, composition, rhetoric, designed to implement other programs for which the student might not be prepared adequately.

Freshman Tutorial. Selected Study Topics announced by the tutor and open to three students per topic on a first come, first served basis. The selected topic would usually relate to both the current events curriculum and a student's intended area of concentration (after the freshman year). More than one could be taken at a time.

Simulation. Quarterly workshops on selected topics of local, national or international concern. Participants would assume roles and attempt to resolve, negotiate or otherwise render an opinion on a problem.

(See Appendix B for a typical Current Events Program.)

The College of Health

The College of Health would be a separate school of the Urban University. Like other colleges at the University it would be headed by an administrative officer and staff responsible directly to the Urban University.

The College of Health, in addition to its regular classrooms and basic science laboratories, would establish: (1) The University Teaching Hospital, a fully accredited urban hospital, resembling a county hospital in concept with training facilities in every department and regular rotating apprenticeships and internships; (2) The Outpatient Center, an area of the hospital for the treatment of individuals who do not require hospitalization, or who must undergo outpatient therapy after hospitalization. The Outpatient Center would be located at the University Teaching Hospital. It would have many branches, known as Outpatient Clinics, located throughout the metropolitan area; (3) The Allied Health Center, a hospital division engaged in the annual Multi-Phasic Screening of every resident of the city.

The Allied Health Center would operate both mobile (trailers) and static (permanently situated) multi-phasic screening (MPS) units. Personnel operating these units would be trained, for the most part, in the Allied Health Program. MPS units would be almost completely automated but would include trained personnel who would assist patients and take over in case of machine failure. An individual would be given a thorough physical including medical history, electrocardiogram, blood pressure, pulse, height, weight, visual acuity, glaucoma test, heart and lung capacity, hematology, urology, smears and cultures (where necessary), mammography, sigmoidoscopy, gynecological examination and chest x-ray all in about ten minutes. The total cost for the examination would be nominal.

Allied Health units would also perform immunological services for everyone. It would work very closely with the Department of Health Administration and provide instant mobility in disasters and health crises such as epidemics.

The College of Health would train students, who will serve the community, in various aspects of health care. The College would be geared mainly toward the administration of practical health care. Pure Science Research is so vastly important in itself that it would be undertaken apart from the Urban College of Health. However, Clinical Research Centers would be located in the University. The College of Health would be a licensing agency as well as a training center; it would be instrumental in formulating health care policies and staff and urban health facilities.

The Allied Health Program would be directly concerned with health screening. The basic goal of the program would be to develop and maintain a sound, multi-phasic health screening program. Specialists in the Allied Health Program would be: (1) Health Screening Technicians, who obtain blood and urine samples, gather physical data such as height, weight, appearance, take medical histories, blood pressure and pulse; (2) Health Programmers, who transcribe medical histories and current health status data on to keypunch cards, program cards for detection of patients requiring further screening, catalogue health information for the data bank, prepare data reports for biostatistics; (3) Immunology Technicians, who administer routine and special immunization injections, tuberculin skin tests and similar tests.

The program in Health Administration would offer specialties in Hospital Administration, Community Health, Health Education and Medical Records. This program would be the nerve center of the College of Health so far as implementation of the various programs is concerned.

Hospital Administration Specialists would be trained in all levels of hospital function and community health care.

Community Health Specialists would serve internships in Multi-Phasic Screening, Hospital Administration, and Health Care Delivery. Specialists would study Medical Care Organization, Public Health, Health Economics, Governmental Services in health fields, Administration of Medical Care, legal and social aspects of health care delivery, Health Education and Health Records Service.

Health Education Specialists would study past and current health education systems, technical, administrative and social (indoctrination), and implement experimental programs wherever needed and whenever feasible. Behavior and Health, Education and Health, Health Education in Community, Mental Health, Research in Health Education, Clinical Aspects of Health Education, Technical Training of Health Personnel, Testing and Licensing of Health Practitioners, Medical Education, Para-Medical Education, Advanced Medical Education, Internships (on the job training at all levels) would all be covered.

Medical Records Specialists would be trained to any one of four ascending levels: (1) Secretarial, involves routine admissions and reservations, billings, etc.; (2) Clinical Librarian, involves delivery and updating of charts and records, obtaining records, etc.; (3) Medical Records (MR) Librarian, involves maintaining extensive medical records at the hospital level, processing and procuring; (4) MR Scientist, involves development and implementation of methods and systems in medical records. All programs in the College of Health would be designed to allow flexibility in a general health care delivery system. Specialists would be allowed freedom to study the adjacent specialties.

The program in Health Science would be the practice and research arm of the College of Health. In effect, it would be the base from which the

Allied Health program emanates. Specialists in Health Science could choose from a complete ladder of practitioner levels designed to fit into the overall structure of the health care delivery system of the community. Research would be limited to practical studies in the various fields. Biostatistics would integrate research data from external and internal sources.

Biostatistics. Specialists would pursue studies in demography, statistics, clinical trails, surveys in medicine, statistical models, stochastics, epidemiological mathematics. Two objectives of the program would be; (1) to train statisticians who will develop more useful statistical techniques for the bio-medical and health delivery programs, and (2) to train statisticians who will provide a statistical synthesis in various health settings.

Enviro-Nutritionists. Specialists would be trained for research, teaching and service in fields that relate to health and environment/nutrition. They would provide input to biostatistics on community dietary habits, environmental hazards, nutrition-disease factors as they may exist in a given area and pollution (germicidal, industrial, communal). Specialists would pursue studies in Nutritional Analysis (Quantitative), Pathological Processes, Social Biology, Physical Biology, Nutrition Physiology, Pollution, Population and Food Supply, Environmental Health, Laboratory Technology in Enviro-Nutritional Sciences, Environmental Stresses, Toxicology, Occupational Diseases, Occupational Medicine, Health and Housing, Health and Work.

Behaviorist. Specialists in this area would be trained for different career levels in psychology. Observers would be trained to study and report human behavior in non-clinical settings; Clinicians would be trained to administer and evaluate psychological tests of a non-biological nature; Psychologists would be trained for personality evaluation and counseling in routine environmental situations such as home, factory or school with sub-specialties in gerontology, pediology and sociology; Clinical Psychologists would be trained to deal with neurotic and psychotic behavior. Psychobiologists would be at the top of this career ladder. They would be specialists in laboratory/clinical experimentation involving physiological agents and techniques with normal and pathological subjects.

Post-Medical Specialties. There would be development possibilities in many post-medical studies areas such as Epidemiology, Infectious Deseases, Occupational Medicine and Medical Research. Although designed for medically trained individuals, this program would be open to other individuals whose education or experience enabled them to handle the sophisticated material.

Urban Medicine. The six-year program in Urban Medicine would offer an M.D. degree to those who became doctors specializing in physical problems and diseases peculiar to urban life. An additional year would be required for specialties in pediatrics, geriatrics and sociatrics. There would also be intermediate programs based on a career ladder in medicine; one, a four year program leading to a license for Assistant Practitioner, another, a five year program leading to a license for Medical Practitioner. According to the career ladder in medicine, the different licenses would be commensurate with both time spent at the University and training.

Nursing. The Nursing Specialty would be very similar to the Assistant Practitioner Specialty but emphasize the physical rather than medical needs of patients. It would be a three year program. If a nurse, after completing the Nursing Specialty, chose to specialize in Gerontology, Pediatrics, etc., she or he would undergo additional training.

Diagnostics. The Diagnostic Technician would perform limited nursing duties and examinations. This specialty would be similar to the Assistant Practitioner program but without the science background. The Diagnostician would not be trained for hospital work but for multi-phase screeing work and only to make a general, not specific, diagnosis.

Medical Technology. This specialty would be a three-year program in laboratory technology. X-Ray Technology would be an equivalent subspecialty, requiring only one-half of the science background.

Pharmacy. There would be three levels here: (1) Pharmacist, who disperses prepared drugs in strengths and amounts prescribed; (2) Pharmaceutician, who prepares drugs and dispenses them in prescribed strengths and amounts; (3) Pharmacologist who does research to develop drugs for use in the health fields. These specialties are related to the concept of generic pharmacy; the training and education involved would have the same emphasis.

Hospital Science. This would be a one-year specialty that trains individuals to perform routine hospital chores such as escorting patients, preparing meal trays, hospital hygiene (janitorial), sterilization, patient comfort.

Clinical Science. This would be a one-year specialty with the same aim as the Hospital Science program but with an emphasis on clinical administration.

Mid-Wifery. Specialists who attain level three in the Department of Medicine could be licensed as Mid-Wives for service (practicum) in Allied Health. It might be suggested but not required that licenses be issued only to those individuals interested in continuing, presently or at a later date, in University programs for eventual licensing in Obstetrics-Gynocology. Mid-Wives would be automatically licensed as Diagnostician, also.

Dental Science. The Dental Science program would operate in two areas. The first area would be congruent to the program in Medicine and called Dentistry. It would follow the Medicine career ladder exactly, with appropriate clinical experience, and offer the following levels to match the Medicine levels; Chemist(Dental), Dental Diagnostician, Assistant

Dentist, Dentist, Oral Surgeon. The second area is analogous to the Health Science program in Clinical Science. It would offer the following matching levels: Dental Secretary, Dental Hygienist, Dental Planner.

College of Vocational Science

The College of Vocational Science would provide individuals with career opportunities in jobs essential to urban living. The largest individual department in the College would be the Department of Building, which would offer career specialties in all building trades, architecture, engineering and contracting. The Urban Engineer specialty would be a combination of architectural and civil engineering. Other departments in the College of Vocational Sciences would be the Department of Urban Services, the Department of Food Technology, the Department of Industrial Science, and the Department of Domestic Services.

In the College of Vocational Sciences, career ladders would be designed on inverted pyramids so that an individual's area of competence would not become funneled into a narrow aspect of the entire science. As the individual progresses in both experience and training, his area of competence would become a broad base with a variety of built-in special skills. (See Appendix C for illustration.)

In each of the College of Vocational Sciences schools, there would be basic one and two-year specialties which prepare the student to take additional training so that he could qualify for broader specialties such as Federal Contractor and Urban Engineer in the Department of Building; Utilities Engineer and Urban Clothier in the Department of Services; Food Packaging Engineer and Nutritionist in the Department of Food Technology; Manufacturing Economist and Tool and Die Designer in the Department of Industrial Science.

Department of Urban Services would train technicians, junior and senior engineers, and planners.

Department of Food Technology would train inspectors, supply expediters, nutritionists, food packagers, and processers.

Department of Industrial Science would train, among others, safety engineers and consumer technologists.

Department of Domestic Services would train, among others, safety engineers and consumer technologists.

The student in each college would choose to specialize by going straight up the career ladder, or broaden his knowledge by expanding into different areas. Thus he could select narrow career specialization or broad, interdepartmental studies. All students, then could prepare for different urban careers.

College of Community Science

The College of Community Science would offer career training in community welfare. Departments in the College of Community Science and their specialties are:

Department of Community Relations, with specialties in Law, Law Enforcement, Legal Records, and Criminal Investigation; and advanced two-year internships in Jurisprudence (for Judge-elects), Domestic Relations and Urban Dynamics (for Police Chief and Survival Commissioner-elects).

Department of Transportation, with specialties in Urban Transit, Air Control, Traffic Administration, Airport Science, Highway Construction and Repair, Commerce and Shipping (Water, Rail, Air, and Road).

Department of Welfare, with specialties in Housing, Social Welfare, Employment, Rehabilitation, Culture, and advanced internships in Gerontology, Ethnology and Pediology.

Department of Communication, with specialties in Media, Telephonics, Publishing, Journalism, Broadcast Science and Communications Technology.

As with similar programs in other Colleges of the Urban University, licenses in the higher levels of civil service specialties would not guarantee promotion to positions because (1) the job might already be filled; and, more important, (2) while being licensed would be more than a simple fulfillment of minimum requirements for a civil service position, one would be required to demonstrate the equally necessary personality qualities that would qualify him for a job.

College of Environment Science

The College of Environmental Science would offer development programs in environmental investigation and control. Specialty areas would include: Pollution (water, air, resource), Population, Natural Resources, Idiomilieu (everything that affects the individual in his natural environmnet, including weather) and Environmental Planning.

Each specialty program in the College of Environmental Science would be divided into two major divisions. The first division would be the Investigation Division geared to the development of inspection and reporting skills;

the second division would be geared to the development of research and control skills through advanced science exposure. The second division would be actually a continuation of the career ladder programs begun in division one. (Specialty levels are in Appendix D.)

College of Education

The College of Education would be divided into four schools:

The School of Self-Awareness and Creativity would be a medium for expanding the Self-Development studies begun in the College of Current Events and also a medium for developing creative and performing arts. There would be no career ladders in this school. Programs in Self-Awareness would run for two years; programs in the Arts for three years. Studies would be offered in Self-Awareness (topics selected by individuals), Dance, Acting, Music, Creative Writing (poetry, fiction, drama, cinema, television), Manual Arts (sculpture, painting, ceramics, pottery) and Voice. Teaching Practice and Educational Methodology would be basic to all studies.

The School of World Science could be entered by a student only after completing three years at a different school. This school would begin at level four and be designed to provide in-depth studies in various academic fields to individuals interested in University Teaching careers in any specialty. Certificates, rather than licenses, would be granted at the end of each of the four years of the program. For instance, after the first year of successful study and practice teaching in this school, the World Science One Certificate would be granted. All programs are interdisciplinary and cover diverse fields.

The School of Urban Reviews would actually be the self-evaluation branch of the Urban University. On the basis of a continous seminar program evaluating each Urban University specialty, the School of Urban Review would make recommendations for improvements. Each seminar would have a minimum of 12 members; half of the members would be from the community and should not be directly affiliated with the University, one-fourth should be affiliated with the University and, in particular, with the specialty being examined, and one-fourth should be University people from any area. This school would prepare semi-annual reports on its observations of its specialty's programs and include information from the community; then it would make recommendations to the University's program through the Associate Director of the University.

The School of Educational Science would be devoted to training primary and secondary school teachers. It would be very similar to the School of World Science but emphasize methods. Programs would be from five to eight years in length, depending on the input level. There would be no prerequisites for entrance into the school but the Current Events Program would be strongly recommended. Practice teaching (classroom assisting) would begin the first year. General subject matter emphasis, selected by the student, would be studied along with methodology and classroom assisting with certificates granted from level five on, each reflecting the level attained.

School of Political Dynamics

The School of Political Dynamics would be analogous to the School of Urban Review (in the College of Education), but deal with the metropolis. This School would be the self-evaluation branch of the metropolis. It would perform in the same way as Urban Review except that its information would come from all university levels and from the community. At least half of its seminar membership would be people who have no university or governmental affiliation; they should also be free of direct self-interest in the specific business of the seminar. Residents of the metropolis would suggest topics to be covered in the seminars. Recommendations of the seminars would be submitted in the form of Urban Bills of officials of the city.

In addition to the continual seminars, the School of Political Dynamics would offer five to eight-year programs in its departments of Labor, Economics, Production, Research, Government, Health, Community, and Education.

The Faculties Program

The Faculties Program would be designed to enable individuals, already executives or experts in their own fields, to expand their knowledge to other broad areas of urban science. Presumably, but not necessarily, these individuals would be candidates for or already members of the higher levels of city and state administration, urban planning or commercial (business, industry, finance) management.

Three courses would form the core of the Faculties Program. They would be completely flexible and allow variations and substitutions, depending on the individual's previous training and experience. Special courses would be set up routinely as the need is perceived by Urban Review and Political Dynamics seminars.

Admission to the Faculties Program would require a minimum of seven years of training. This is merely a guideline, though, and any aspirant might be admitted, on the recommendation of the Associate Director of the University.

The three core courses would be five-year programs in City/State Administration, Urban Design, and Commercial Management. Each year of a given course would be devoted to a specific area of urban science through the use of seminars, colloquia and practicums. Usually, the specific area of urban science would be approached on the administrative rather than the technical level. Achievement certificates would be issued after the 2nd, 3rd and 4th years, and the Faculties Certificate awarded after the 5th year.

Ideally, an individual would complete his course in five years; however, each Faculties participant would set his own pace. Because experience in the field would be an integral part of the program, it would not be likely that a course could be completed in fewer than five years. Also, to maintain a dimension of cohesiveness in the program, individuals should plan to complete their course in 10 years at the longest. (For example of this Program, see Appendix E.)

SUMMARY

In summary, the Urban University, through its administrative policies, educational programs and research facilities, would strive to achieve the total integration of urban concerns (communal, environmental, governmental and academic); a precise but flexible balance between intra-urban factors (such as supply and demand in urban economy, health research and health delivery in urban health, technology and safety in urban environment, manpower distribution and manpower utilization in urban labor); the re-establishment of the urban community and thus, the de-alienation of the urban man by emphasizing the major significance of the individual through collaboration and cooperation; and the development of an excellent, but certainly not elite, corps of urban scientists who would lead the way in all areas of "urbanology."

APPENDIX A: CAREER LADDERS

The career ladder concept, upon which most programs at the Urban Univeristy would be based, permit several kinds of progress toward one's professional goal.

Single-Ladder Vertical Progress

The basic design of each program at the proposed Urban University resembles a ladder. Each rung of the ladder usually represents a license level. A person may step off the ladder at any particular level and practice his profession according to the limits of his license. He may also be licensed at each level and continue to the next higher level. Each rung of the vertical ladder represents approximately one year's work at the Urban University.

An example of Single Ladder Vertical Progress is the Nursing Specialty of the College of Health Sciences. The nursing program required six years of study and leads to the license level "Doctor of Nursing Science." The first license level in the nursing program comes at the end of the second year of study and is called "Nursing Assistant." A student may remain in the program, doing work/study as a Nursing Assistant and progress toward the next level "Registered Nurse." A person who leaves the program at any level may return to the program at the same (or sometimes higher) level when he desires.

Levels in the Nursing Specialty are "Registered Nurse-Specialist" (level three, requiring a minimum of four years of study); "Visiting Nurse" (level four, minimum five years of study); "Doctor of Nursing Science" (level five, minimum six years of study).

Table 1, Career Ladder Levels for the Program in Health Sciences, pages 12-31 and 12-32, demonstrates the kinds of career progress possible in the Nursing Specialty. Single-ladder vertical progress can be seen by following the blocks with the diagonal bar, including those blocks which are also shaded, and those blocks which are also divided by intersecting diagonal bars.

The different specialties are listed across the bottom of the chart opposite the notation "1st Year."

Multi-Ladder Vertical Progress

Most programs at the Urban University are designed to permit "voluntary crossing over" to related specialties. For instance, a person who begins his studies in the Nursing Specialty could quite easily "cross over" to a specialty in Health Administration or Allied Health.

Also, several programs are designed on a "built-in crossing over" basis. The specialties in Allied Health, for instance, are actually begun in the Nursing program of Health Sciences. There are two non-nursing license levels in the Nursing Specialty. The first, "Health Screening Technician," is given after two years of study. Note that another license, "Nursing Assistant," is available at the end of the second year of study in the Nursing Specialty. Choice of license is up to the individual, based on his career goals. A person opting for the "Health Screening Technician" license at the end of the first year will not necessarily be expected to take the "Immunology Technician" license at the end of the second year. Both these license levels are part of the program in Allied Health. Because they require experience and core science familiarity exactly like those of the Nursing Specialty, they are begun in the Nursing Specialty. Examples of "voluntary crossing over" and "built-in crossing over" are demonstrated on Table 1, Career Ladder Levels for the Program in Health Sciences, page 12 - 31, continuing on Table 2, Allied Health and Health Administration, page 12 - 32.

An individual may begin his studies in the Nursing Specialty. At the end of his year of study, (that is, when he is in the fourth level of his Health Science Specialties) he may "cross over" to Health Administrator. He does so by entering Health Administration at the second level.

Follow his progress by beginning again at the Nursing Specialty ladder on Table 1. He progresses along the blocks which have intersected diagonal lines (X's). (Some of the blocks also happen to be shaded.) After he has reached the end of his third year (R.N. License), he is theoretically in his fourth year. He, then crosses over to Health Administration at the next lower level. Consult Table 2, page 12 - 32, and follow the blocks with the intersecting diagonal lines (X's). In Health Administration, he has selected the "Community Health" specialty. He enters the "Rotating Practicum" level, which is labelled on the left "Input from 4th level Health Science Specialists." Note that the highest level at which entry is possible in Health Administration is level 4. This is an example of "voluntary crossing over."

On the other hand, an individual may enter the Nursing Program as an Allied Health student in one of the Allied Health Specialties. He must spend one or two years in Nursing, depending on his anticipated specialty, and then "cross over" to the program in Allied Health. In the example indicated by the shaded blocks, the individual first spends two years in the Nursing Specialty receiving his "Immunology Technician" license. He crosses over then to level 3 of the Allied Health program. At the end of his fourth year of study, that is, when he is theoretically in his fifth year of study, he crosses over, again voluntarily, to the Health Administration program with a specialty in Community Health.

Voluntary crossing over is possible in all programs at the Urban University. In certain programs, however, it could be a formidable task because different programs train different skills. For instance, it would be almost impossible to "cross over" from the secretarial and custodial specialties into one of the scientific specialties (urban medicine for example) without starting at the very bottom of the new ladder.

Pyramidal Progress

In the College of Vocational Science, pyramidal programs, as previously described, can be undertaken. Page 12 - 33 shows a diagram of a pyramidal program for the plumbing specialty. Input into the program is from level three and above of the plumbing specialty.

On the diagram, progress begins at the very center of the table, in the top arm, labeled 1. Movement is clockwise from arm 1 to arm 2 to arm 3 to arm 4, in the block nearest the center in each arm and labelled respectively, F,G,H,J. These letters refer to the code in the upper right hand corner of the page, and refer to the practicums involved in the pyramidal program. Each complete clockwise rotation represents one year of study at the University. Succeeding years radiate concentrically outward from the first year, with studies for the new year always beginning in arm 1. For instance, the second year curriculum involves practicum in A,B,C,D, respectively. Note that one may "cross over" after level 2 of the pyramidal program to level 4 of the specialties A,B,C,D.

The pyramidal programs are highly intensified courses of study running the full year. They require almost twice the daily time devoted to regular courses in the same school. The ultimate attainment in the pyramidal program is licensing as Urban Planner. Holders of this license would be qualified to direct any aspect of Urban problem solving or planning.

APPENDIX A (continued)

CAREER LADDER LEVELS FOR THE PROGRAM IN HEALTH SCIENCES

O= Licensure Levels
*= Allied Health Specialty

LEVEL SEVEN ADVANCED SPECIALTIES OPEN TO ALL LEVEL SIX PERSONNEL
EPIDEMIOLOGY, INFECTIOUS DISEASES, OCCUPATIONAL MEDICINE, MEDICAL RESEARCH

To Advanced Specialties in Geriatrics, Pediatrics, Gyn-Ob., et

	BIO-STAT.	EN-NUT.	BEH	MED.	NURS.	DIAG.	MED. TECH.	RX	HOSP. SCI.	CLIN. SCI.
6th Year	Advanced Bio-Statistician	Advanced Enviro-Nutritionist	Psychobiologist	Urban Doctor -Oral Surgeon	Doctor of Nursing Science		Doctor of Laboratory Technology	Pharmacologist		
5th Year	Bio-Statistician	Enviro-Nutritionist	-Clinical Psycho. -Asst Psy-Biologist	Medical Practitioner -Dentist	Visiting Nurse		Clinical Chemist	Pharmacological Assistant	TO PROGRAM IN HEALTH ADMINISTRATION	
4th Year	Medical Mathematician	Enviro-Nutritionist Assistant	-Psychologist -Health Social Worker	Asst. Practitioner -Asst. Dentist	R.N. Specialist (Surgery Anesthesiologist etc)		Laboratory Technician	Pharmaceutician	A B C D E F G	
3rd Year	Surveyor	-Environmental Engineer -Dietician	Clinician	-Diagnostician -Midwife -Dent.Diag.	R.N.	Diagnostician	Asst. Lab. Technician or X-Ray Technician	Pharmacist	Planner	Planner Dental Planner
2nd Year	-Statistical Aide -Surveyor Aide	-Dietetic Aide -Sanitician	Observer	Chemist (Medical) (Dental)	Nursing Asst. or *Immunology Technician	Assistant Chemist	Chemist (Lab.)	Chemist (Lab) or Rx Aide	Steward	Steward Dental Hygienist
1st Year	--C O R E S C I E N C E S ----------(ESPECIALLY CHEMISTRY)-------------CURRICULUM----------				O *Health Screening Tech.				Hygienist	Receptionist Dent. Sec'y

TABLE 1

APPENDIX A (continued)

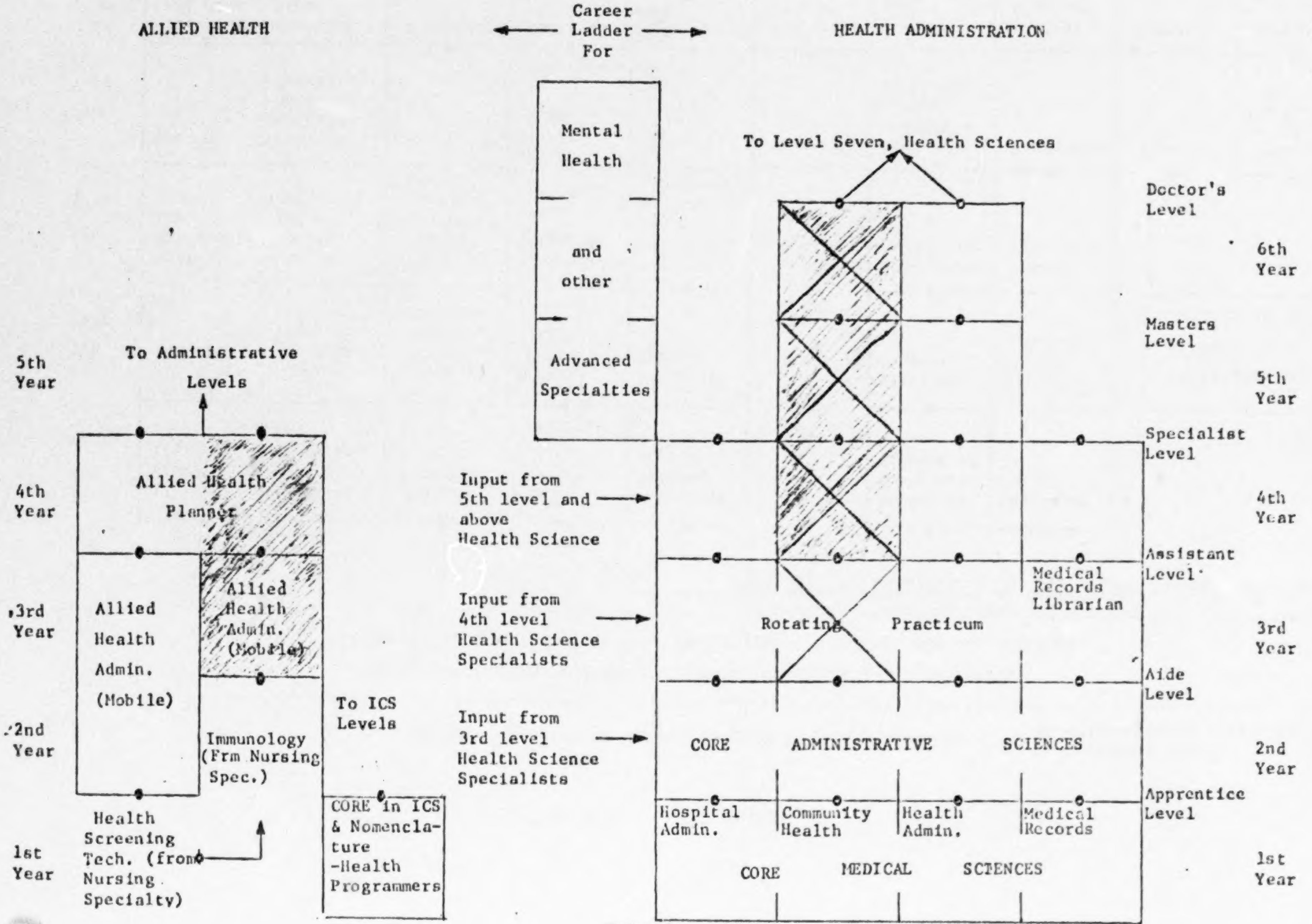
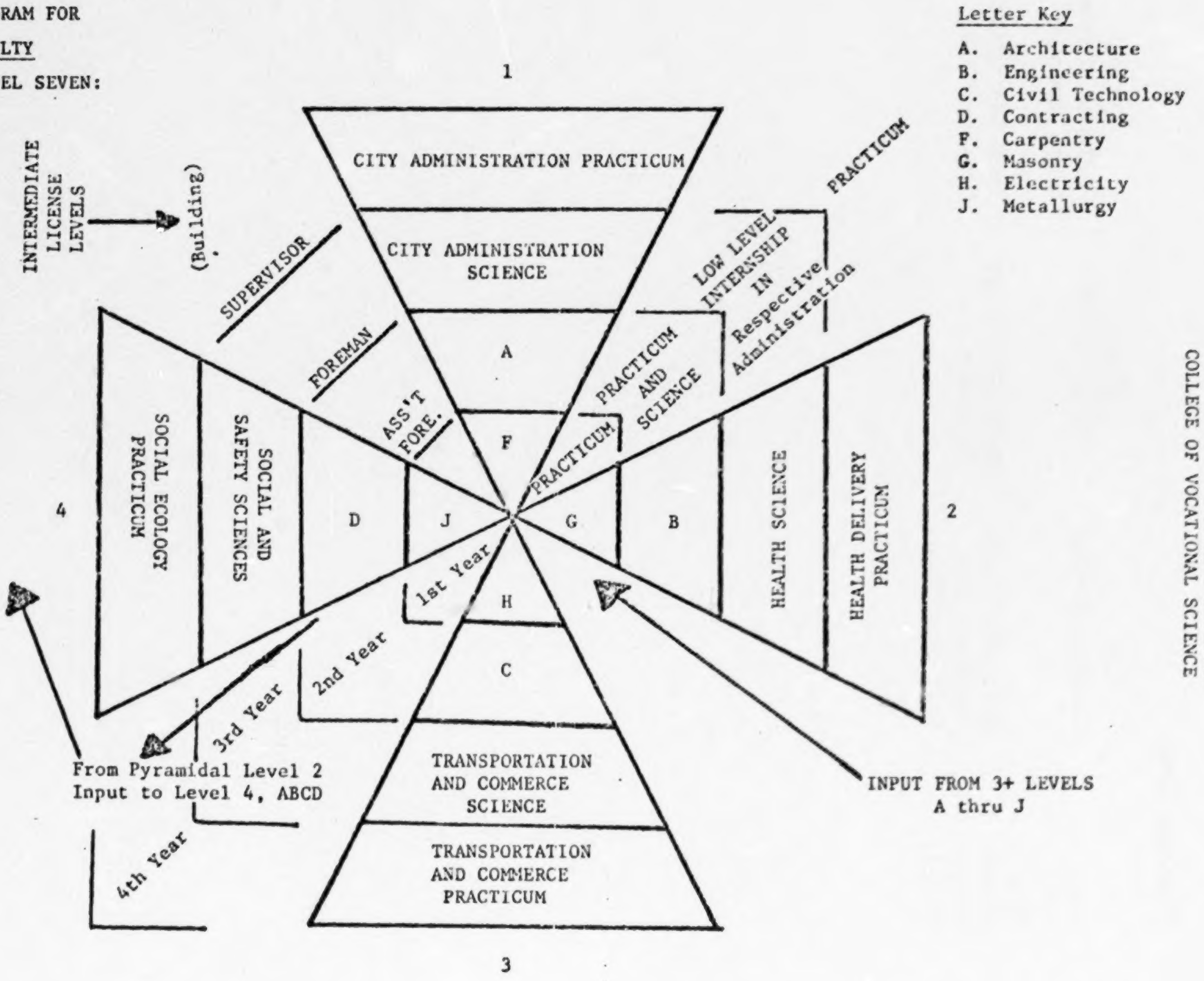


TABLE 2

APPENDIX A (continued)

TABLE 3. PYRAMIDAL PROGRAM:
COLLEGE OF VOCATIONAL SCIENCE

PYRAMIDAL PROGRAM FOR
PLUMBER SPECIALTY
LEADING TO LEVEL SEVEN:
URBAN PLANNER



APPENDIX B

A TYPICAL CURRENT EVENTS PROGRAM FOR A FIRST YEAR STUDENT

Freshman Year

	Fall	Winter	Spring	Summer
Req.	Current Events	Current Events	Current Events	
Req.			Comp. Events	Comp. Events
Req.				Analysis
Elect.	Self-Dev.Study	Self-Dev.Study	Self-Dev.Study	Self-Dev.Study
Elect.	Freshman Tut.	Freshman Tut.	Freshman Tut.	Freshman Tut.
Elect.	Self-Dev.Study			Simulation

APPENDIX C

CAREER LADDER:
COLLEGE OF VOCATIONAL SCIENCE

Department of Urban Services

Specialty Science	Levels (Read Across)					
Gas	Meterman-	installer-	repair tech.-	design tech.-	jr.engin.-	sr.engin.
Water	"	"	"	"	"	"
Electricity	"	"	"	"	"	"
Fuel	"	"	"	"	"	"
Electronics	Calibrater	"	"	"	"	"
Communications	Operator	"	"	"	"	"
Safety	Checker -	technician-	inspector -	jr. engin. -	sr. engin.-	planner

Department of Food Technology

Specialty Science	Levels (Read Across)			
Food Processor	Processor	Proc. Foreman	Technician	Methodist
Food Packager	Packager	Pack. Foreman	Technician	Designer
Food Technology	--	Chemist	Technician	Scientist
Food Synthesis	--	Chemist	Technician	Engineer
Nutrition	--	Chemist	Technician	Nutritionist
Supply	Expediter	Ass't Sup.	Supplier	Planner
Safety	Grader	Ass't Inspect.	Inspector	Planner

APPENDIX C (continued)

Department of Industrial Science

Specialty Science	Levels (Read Across)
Maintenance	Helper-Apprentice-Journeyman-Inspector-Foreman-Supervisor
Machinist	" " " " " "
Tool & Die Maker	" " " " " "
Heavy Equip. Op.	" " " " " "
Freight Mover	" " " " " "
Manual Technician	" " " " " "
Ind.Oper.Tech.	Observer-Ass't Test.-Tester--Jr. Psycho. -- Psychologist
Ind.Supply Tech.	Expediter-Inv. Tech.-Ass't Supp.-Supplier
Ind. Manager	Clerk - Asst Off. Man.-Off. Man.-Jr. Man.--- Grad. Manager

Specialty Science	Levels (Read Across)
Ind. Accounting	Biller-Budgetary-Jr. Acct.-Sr. Acct.- ---- Ind. Acct.
Ind. Safety	Checker-Technician- ---- Inspector-Engineer-Planner
Ind. Design	--- Draftsman --- Jr. Design.-Designer
Ind. Engineer	--- " --- Jr. Eng. Engineer

APPENDIX C (continued)

Department of Domestic Services

Specialty Science	Levels (Read Across)	
Domestic Supply	Expediter-Inv. Technician-Ass't Supplier	Supplier
Sewage & Disposal	Collector-Ass't Inspect.-Inspector	
Restaurant & Enter.	Main. Man-Ass't Inspect.-Agent-Ass't Man. -	Manager
Public Residence & Resorts	Maint. Man-Ass't Inspect.-Agent-Ass't Man.-	Manager
Consumer Technology	Clerk - Purchaser-Ass't Designer- ---	Designer
Safety Engineer	Aide - Ass't Inspect. - Inspector ---	Planner

APPENDIX D

COLLEGE OF ENVIRONMENTAL SCIENCE: CAREER LADDER

	1st Division				2nd Division				
Level (Year)	1st	2nd	3rd		4th	5th	6th	7th	8th
Specialty:				Specialty Accelerated Program for crossing over					
Pollution (water)	Sampler	Reporter	Inspector		Technic.	Ass'tScien.	Scientist	Planner	Environmental Planner
Pollution (air)	"	"	"		"	"	"	"	
Pollution (resources)	"	"	"		"	"	"	"	
Population	Census Taker	"	"		"	"	"	"	
Natural Resources	Observer	"	"		"	"	"	"	
Idiomilieu	"	"	"		"	"	"	"	
Envir. Planning	"	"	"		"	"	"	"	
Studies	Core Science and Inspection Skills				Advanced Science, Research Skills Administration				

APPENDIX E

FACULTIES PROGRAM

Program Title	Designed for Level 7 Specialist in:	1st Year	2nd Year	3rd Year	4th Year	5th Year
City/State Administration	Any Category	Pol. Dynamics/ World Sci.	Voc. Sci	Community Science	Health Science	Envir. Science
Urban Design	Health Sci./Educ./ Voc. Sci.	"	Comm. Sci.	"	Envir. Science	"
Commercial Management	Health Sci./Educ./ Comm. Sci./Envir.Sci.	"	Voc.Sci.	Voc.Sci.	"	Comm.Sci.

Following, is the history of a hypothetical career. The individual is a female who entered the Urban University on her 17th birthday.

APPENDIX E (continued)

Age	University Program	Level	Career Progress	Remarks
17	Current Events	0	---	
18	Health Science,Behavior	1	---	
19	"	2	---	She is licensed as "observer" at end of this year.
20	"	3	At start of year, takes part-time job at Univ. Hosp. in addition to work/study	Licensed as "clinician" at end of year.
21	"	4		Licensed as Psychologist at end of year
22	Health Administration	5(3)	Part-time psychologist for Hosp.	Enters 3rd level of Admin. program.
23	"	6(4)	Part-time Administrator for Hosp.	Licensed Admin.Spec. at end of year.
24	"	7(5)	Takes full-time Admin. position at Health Care Facility	Master of Admin. license at end of this year.
25	None	--	Administrative Ass't	Personal crises precipitates leaving University.

APPENDIX E (Continued)

Age	University Program	Level	Career Progress	Remarks
26	None	--	Ass't Dir. Outpatient Services	--
27	"	--	"	--
28	Health Administration	8(6)	"	At end of this year receives Dir. of Admin license.
29	---	--	"	
30	---	--	Director of Outpatient Services	Univ. Health Care Fac.
31	Faculties Program	9(8)	"	Enters City/State Admin. program.
32	"	10(9)	"	--
33	"	11(10)	"	--
34	"	12(11)	Ass't Dir, Metropolitan Health Care Delivery Office	--
35	"	13(12)	"	Receives Faculties Certificate
36	--	--	Promoted to Directorship of the Metropolitan Health Care Delivery System	

APPENDIX E (continued)

Facts

13 total years of post secondary education and training

17 total years of continuous work experience

at age 26, held first position of supervisory nature

at age 30, held position of great responsibility

at age 34, held position of broader responsibility involving the entire population of the city.

at age 36, ultimate responsibility for Health Care in the Metropolis

CHAPTER 13

HIGHER EDUCATION AND THE WORLD OF WORK

Numerous responsible analysts of our system of higher education have expressed great concern with the deficiencies in the system which result in our failure to prepare a large segment of our population to take their place as productive members within our society. The dissatisfaction of the students with the lack of information about occupations and the colleges' contribution in preparing them for employment (Trent and Medsker, 1968); the limitations in vocational education pointed out by the President's Panel of Consultants on Vocational Education (1962); "the failure of our schools to educate to the level of adequate employability nearly 25 per cent of the young men and women who turn 18 each year" according to the latest annual report of the National Advisory Council on Vocational Education; the low correlation between professional training and the skills and practical competence needed for success in a variety of professions (Hoyt, 1965); the observed "resistance of academicians to the pedagogic potential of practitioners" (Jencks and Reisman, 1968); the discrepancy between the profession as a symbol (e.g., the lawyer as courtroom advocate, the doctor as surgeon-hero) and the realities of work life as experienced by the vast majority of the profession (Becker, 1962) - these problems are the cap of the iceberg of discontent with much of the occupational preparation of American youth.

The world of work is commonly divided into occupational categories arranged in a hierarchy ranging from the professional (law, medicine, education) down through the sub-professional, technical, skilled, to the non-skilled. Much has been written on the finer points of this classification but this discussion is often more confusing than helpful (or is at best irrelevant) when the question of education or training for a specific occupation is raised. Two criteria which Abraham Flexner (1915) used to distinguish the profession from the other orders of occupations are especially pertinent: in Flexner's view the professional activity is basically intellectual and carries great personal responsibility, and it is learned, implying a knowledge base which is transmittable from one person to another.

Since Flexner's time the classification and definition of occupations has proceeded apace. Generally, however, authors and educators tend to stick with two larger categories when discussing education for employment: vocational-technical and professional. The former usually implies an education of 12 to 15 years with most of the last 2 to 3 years devoted to occupational skills; the latter implies a minimum of a Bachelor's degree as a necessary but usually not a sufficient requirement for entry into the profession. Such categories have a utility for making somewhat manageable classifications out of a broad range of occupations. On the other hand, certain critical questions are obscured by this dichotomy. In view of the changing nature of the occupational scene which has resulted from technology and the increasing societal sensitivities to environmental problems, a thorough analysis of the educational requirements of each occupational classification should be mounted.

The central issues revolve about 1) the nature of the knowledge and skills of a general and specific type required for job entry, for job advancement, and for occupational mobility; 2) the locus of the responsibility for credentialling, certifying a certain minimum entrance standard for the occupation; and 3) the costs to society and the individual of extending the formal education and training experiences beyond a point where the rate of acquiring necessary knowledge and skills is diminishing and the cost of withholding the individual from a productive role in society has greatly increased.

Even if we could assume that the average graduate from secondary education at present is equipped with the necessary knowledge base and skills for fulfilling his role as a citizen in a democratic society, it would be much more difficult, in face of the research evidence, for us to assume that he is likewise equipped to enter the job market in a productive capacity. In a recent study Medsker found that less than half of the junior college alumni, who fare better on the average than high school graduates in their first jobs, were satisfied with their job preparation.[1] Venn emphasized in his monograph on Man, Education and Work (1964) that employers are looking for specific skills rather than "bright young men" with only a general education.[2] It seems clear that the development of the needed skills for entry into the job market has not been adequately served to this time. It is not clear, however, for reasons to be stated in some detail later on, that the development of such skills should necessarily fall within the purview of the junior college or of higher education generally.

Several problems arise as a natural consequence of attempting to prepare narrowly skilled people in one organization for service in another type of organization. Any one of all of these problems may be at the root of the problem identified above.

First, there is the tendency for a break-down in communications Although there ought to be a natural interface between them, the organization which prepares a person for employment and the organization which does the employing have qualitatively different objectives, and the difference in orientations is disruptive of normal communications flow. The results are a lack of coordination, even where the best efforts are made, and a consequent relevance gap between the preparation of the student and the needs of the employer.

Related to this problem of communications is the student's lack of knowledge regarding occupational alternatives which Venn refers to in a study growing out of the 1962 study for the American Vocational Association in Washington.

> Job selection in the technological work world has become a desperate affair, often subject to wildest chance and equally often unrelated to the young job seeker's aptitudes and abilities. Many young people are unaware of the range of occupations and have had little opportunity to observe work in its setting. A century ago the young boy or girl participated in the work of the family and had a good idea of what the other men and women of the community did. Today they may know what the home repairman, policeman, shopkeeper, and the truck driver do, but understand little about the work of the chemist, the electrician, the lathe operator or the construction worker. Thus,intelligent transition into the world of work becomes all the more difficult and vocational guidance all the more essential.[3]

Secondly, we may question the ability of any educational institution to adapt quickly enough in technological areas to keep pace with the rate of obsolesence of many skills in business and industry. There is a distinct developmental lag among educational institutions which results not only from imperfect communications with the industrial, business, and professional sectors but, in those areas where large financial investments are required for equipment, texts, and retraining to keep with the latest technology, there is also a lag which develops because the limited resources of the institution make it difficult to keep up with changing models.

The third problem colleges and universities face in accepting the responsibility of vocational and professional training is the duplication of expensive industrial, business and professional facilities by the training facilities on campuses. This in itself may have little, if any thing, to do with student dissatisfaction (unless, as is sometimes the case, the students must learn their skills on outmoded equipment such as second generation computers); but it suggests the possibility of grossly inefficient use of school funds where the opportunity to cooperate with outside organizations in the use of their facilities exists. The growing complexity and concommitant expense of new technologies, inflation, the growing college population and limited resources all join to require an examination of the feasibility of reassigning the responsibility of vocational and professional education by removing it from the campus and placing it in the hand of the successful practitioner. Unfortunately, there is a lack of alternative models which can serve the innovater in occupational education. In an effort to meet this need, one such model is offered.

AN ALTERNATIVE TO CAMPUS-CENTERED PROFESSIONAL-TECHNICAL TRAINING

The following proposal is offered as one alternative to vastly increased expenditures which would be needed in order to support adequately more relevant and effective occupational training if it were to remain on the campuses of colleges and universities. It is offered to meet the needs of relevance, and flexibility in vocational and professional education.

Basic Propositions:

1. The servicing of the pre-entry occupational needs of the student can be substantially improved by clarifying the vast array of vocational alternatives open to him, providing him with early on-the-job exposure to a limited number of vocations in which he expresses an interest and holding open the option of transferring to another type of occupational training or educational program if his first selection turns out to be unsatisfactory.
2. Professional and semi-professional training as well as skilled and technical-level personnel can receive more relevant, up-to-date, and efficient training if the instructional program is tied conceptually and physically to the business, industrial, or professional settings in which the student will ultimately work.

Proposal

It is proposed that those curricula which entail direct and specific training for a particular occupational role, and for which a substantial number of organizations exist which promote this occupation be transferred to these organizations; that these organizations be subsidized by the state and federal governments to conduct educational and training programs on three levels; career observation, first entry skills, and retraining.

To understand what effect such a proposal would have, let us look at it from four different perspectives: the student's, the university's, the profession's (business' or industry's) and the government's.

From the Student's Viewpoint

The student would graduate from high school having had a general education closely akin to the present college preparatory curriculum, but, hopefully, with more flexibility to elect short courses in areas which greatly interest him. (This latter hope is already beginning to be realized in those schools experimenting in varying-lengthed courses and computerized scheduling procedures.) A part of this curriculum, preferably in his junior year, is devoted to an intensive examination of the world of work, especially the skilled, technical, and professional occupations. At this time such details as general educational requirements, length of training period, nature of the work, salary range and benefits are covered. The student has the opportunity to match his own personality characteristics, job criteria, and intellectual ability with the nature and requirements of a wide range of vocational alternatives. He can determine from manpower and employment projections which alternatives will provide the broadest number of positions from which to choose at the point when he finishes his training. The manpower projections would include information about the numbers of students currently being trained for various options. He will be informed of the degree of difficulty or ease of transition from each occupation to a related or distant one on his list of vocational preference.

During his last year in high school, with the aid of a well-trained and well-informed counselor, he will resolve his interest, abilities, and academic record, with his knowledge about interesting occupations, narrowing down the range of alternatives to several ranked according to his priority of interests, the alternatives' relationships to each other, or the probability of his qualifying for entrance into the training program.

Upon graduation from high school the student selects one of several options; to continue directly to college (if his vocational goal is fairly clear and it includes a college education), to view first-hand in an introductory work-study arrangement one or more of his vocational choices, or to go directly to work in an on-the-job training program. In either of the latter two cases he will have been able to secure a deferred admittance to a college which will guarantee him a place of study for the following year.

If the student goes straight to college upon graduation from high school his curriculum would not be much different at first from what is currently offered as general education in the first two years in community colleges, liberal arts colleges, and universities. He would select a curriculum which gives him a broad exposure to fields related to his occupational interest, and he would begin his "real life" acquaintance with his profession in alternating periods of work and study supervised by a coordinator from his college. His length of stay on the campus would be determined by the requirements of the particular professional or technical program which he would enter and not be the rigid four-year pattern of the Bachelor's degree. In the model under consideration, this pattern of attendence in which the student goes straight from high school to college without the intervening year of vocational exposure is presumed to be unused.

The student's professional education is accomplished at the business, industrial, or professional facilities of his occupation-to-be. It is not an apprenticeship, nor the present type of on-the-job training that has proven unsatisfactory in many circumstances.[4] It is a new opportunity to juxtapose instruction via variety of media, seminars, interactions with the practitioners, and meaningful student involvements in the day-to-day operations of the busines, industry, or professional in a manner which is not generally available at present.

The student may not choose or have the opportunity to take a position with the company responsible for his professional training, but if he does, he will know that there will be continuous opportunity for him to return to the school part-time or for evening classes in order to upgrade his skills.

From the University's Viewpoint

The growing demand for skilled technicians and administrators in the technological areas of atomic energy, computer sciences, health sciences, and television has required a larger and larger investment of limited financial resources to be placed in exceedingly expensive equipment and facilicities. Heavy initial investments, maintenance expenses, and rapid obsolesence have drained funds from an educational program that is required to admit increasing numbers of students. Under the present proposal, universities and colleges generally find the business, industrial, and professional sectors of society furnishing this equipment, and these facilities which are used both for training and for regular business purposes and supported by government subsidy on a pro rata basis tied to the amount of time such equipment and facilities are spent in professional or technical education. What was pointed to as somewhat exceptional practice in industry in 1963 is, in our proposed model, a general policy in an expanding range of occupations.

> Many (evening and other part-time)... courses have available to them the facilities and equipment of industrial plants which are beyond the means of public or private schools. The overall use of plant and equipment is increased by part-time classes meeting at hours when the full-time program is not in operation. The part-time programs often deal with new developments in the occupational fields and tend to keep the day school programs abreast of changing conditions.[5]

A limited number of research institutions, universities and institutes of technology which strongly emphasize the research function will continue to require a full complement of the latest equipment since they are in fact, the professional schools where research is done and researchers are trained. These professional schools will seek increasingly a cooperative use of new technological developments so that full utilization of expensive facilities is achieved. Computer centers such as the Mid-Atlantic Experimentation Research Center (MERC) in Lancaster, Pennsylvania will be imitated by Educational Resource Centers which develop a wide variety of instructional materials from television documentaries and single modular concept films to interactive computer programs for basic courses in the undergraduate curriculum.

The most radical change in the university would be that it could now accomodate a freer flow of students through its facilities. Whereas the student had been rather strongly tied to a rigid Bachelor's degree structure, he would now be able to enter the university for a shorter period of time if his educational objectives require this, stipulate certain educational objectives in advance--educational objectives tied either to certain learning skills or to subject matter--and receive a certification of the attainment of these objectives without suffering the negative consequences of not attaining a Bachelor's degree. By freeing students from a rigid attendance pattern and a prescribed minimum length of time for "getting educated," the university would be accomodating more students and doing so in a way more responsive to their varied needs.

From the Professions's (Business' or Industry's) Viewpoint

The organizations which assume the professional and technical education responsibilities benefit in five ways from this involvement--they obtain a built-in recruitment system which allows them to select their potential employees from the ranks of their students; they are able, to some extent, to fill slack time in their facilities and on their equipment with instructional time, thereby utilizing their plant more efficiently; they exert more direct influence over the content of the professional curriculum and thus guarantee first-entry personnel with usable skills;[6] they are able to maintain at peak usefulness their long-term employees through the release-time, continuing education which their educational program provides; and this is all accomplished with the support of the state and federal subsidy.

From the Government's Point of View

The greatest waste of a national resource any government can incur is the waste of its productive human resources. This waste occurs when either unemployment or underemployment occurs. Neither the problem of unemployment nor underemployment is totally solved by simplistic approaches to the education and training of personnel. Many dimensions of the economic, social, political, and technological environments are involved in creating the situation in which potential producers are unable to locate employment which can fully use their skills. If, however, only the dimension of job training is considered for the moment, two main concerns surface.

First, in a rapidly changing technological society, it is exceedingly important for the nation to retrain its obsolescing worker for a new position as quickly as possible. A delay of several months, multiplied by the lost manhours of several hundred thousand workers is costly.

Second, the efficient use of financial resources which are not inexhaustible must be seriously considered. Investments which can be made cooperatively with business, industry and the professions can increase the benefits derived from each dollar expended. Where business erects an educational plant, federal and state treasuries are relieved of this financial obligation. Examples of the ability to conceive, and implement not only the construction of imaginative, forward looking educational facilities, but flexible, effective curricula are numerous.[7] More such facilities will be needed in the future if the prediction of nearly 7,000,000 post-secondary and adult students are to be accomodated in 1975.[8]

CONCLUSION

The preceding model is predicated upon the evidence that colleges and universities are not meeting an important function of post-secondary education well, i.e., the training of young people for technical, semi-professional and professional positions. Secondly, it is predicated upon the proposition that colleges and universities are not fulfilling this function (where they are attempting to fulfill it) in as efficient a manner as could be done by business, industry and the professions. The model for improving both the effectiveness and the efficiency of occupational training provides that:

1. The primary responsibility for dispensing career information and improving the decision-making abilities of the students lies with the secondary school. The fulfillment of this responsibility should result in the student's being well prepared to choose among a variety of alternatives available to him upon graduation. Both the goals of efficiency (because he loses less time deciding) and effectiveness (because he is more likely to select a compatible career) are served.
2. The primary responsibility of providing first-entry job skills and continuing education for upgrading the skills of the person or for retraining him lies with the business, or industry, or profession, thus providing a closer fit between instruction of the students and the needs of the occupation or profession. Such an arrangement would likewise minimize the redundance of providing expensive tools both for universities and industry, thus saving considerable amounts in public funds for education.

3. The primary responsibility for general education including advanced basic skills in communication, mathematics, science, problem-solving and the curricula of the humanities and social sciences remains with higher education institutions. In most cases this general education will follow the student's initial experience in his occupation-to-be. This initial work experience will aid in focusing his interests within the more general curriculum of the liberal arts because he will have been able to observe (if only briefly) the nature of the "real world" problems which arise in the area of his likely vocation.
4. A significant amount of public support will be funneled to the occupational training sites in business, industry, and the professional offices. It is assumed that on this basis these groups could be encouraged to use their facilities both for training and work, saving both federal and state treasuries from the unnecessary costs of superfluous expensive equipment and facilities. A partnership of these segments of society directed toward separate but complementary responsibilities can bring about the improvement of occupational training more efficiently and effectively than is now accomplished. Not only could this very important educational function thus finally secure the direct attention which is required to keep it relevant to the needs in the world of work, it would free the university to focus on what it does best - general education.

The foregoing model is, of course, presented as an ideal model and as such is open to the criticism of being impractical in the present state of things. The point of the presentation is to stretch the mind to consider new alternatives in education, to help highlight those gaps in our knowledge and in the way we currently do things which prevent us from approaching in reality the goals which the model suggests. After reading an earlier draft of this paper Ralph Tyler summed up these needs in four points which we can do no better than repeat:

1. Improve the information available through the U.S. Employment Service regarding occupations including professions.
2. Educate and employ in the schools and the employment service, persons competent to counsel youth on occupational plans.
3. Develop extensive cooperative education programs with the accompanying changes in college faculty composition and status so that persons able to bridge the gap between work and college would be peers of other college personnel.
4. Provide clearly channeled support for this improved occupational education, support not tied to the vocational teachers' guilds or other associations committed to the status quo.[9]

These needs point to an imposing agenda, much of which is beyond the power of educators alone to implement. It is but one more reminder to educators that they will need to reach out to their constituencies in new ways to establish new alliances which can achieve the needed reforms in higher education and its environment.

Frederick C. Kintzer, on reading a draft of this chapter, observed that a number of community colleges are collaborating with industry to provide educational opportunities in industrial establishments very much along the lines proposed here. He also pointed out that there are a number of functions required by the proposed model that might better be entrusted to community colleges: there is the vocational and employment information function which could be much more efficiently centralized in the community college than scattered about various high schools or industrial establishments in the community; there is the continuing counseling and guidance function which might much more confidently be placed in the hands of a public institution, and a college would be more attractive place to persons who had completed high school; there is the matter of providing background and context and theoretical framework for various kinds of occupations so that individuals will have increased flexibility as a result of having a wider view of their options and potential lines of advancement. Professor Kintzer provided us with the following very relevant quotation from Claude W. Fawcett:

> Several problems are readily identifiable when one contemplates abandoning the responsibility for vocational education in our culture to employers only. Even though some segments of industry are working extremely hard at the task of providing vocational education, only the larger companies are deeply involved, have comprehensive programs, and are succeeding in carrying on reasonably successful programs of instruction. Smaller companies (90 percent of all businesses in this country employ fewer than 100) can afford few programs; their interests are narrow, and their needs cover only a small spectrum of the vocational-education needs of the society. Some businesses are almost unaware of their organizational stake in vocational education for employees. The interests of the employer in vocational education are necessarily restricted to the vocational education that will serve to develop the skills, attitudes, and knowledge of the employees that are pertinent to the goals of the organization. In the light of these quite-restrictive

> factors, it seems unwise for our culture to rely too much on the employer for vocational education, even though he must rely on a self-supported program to develop the resources vital to his organization.
>
> If vocational education came to be provided entirely by employers, some additional dangers to society would necessarily be encountered. Public programs are essential for the employee who wishes to move from one employer to another. They are vital to secure for the workman an opportunity to move from one occupation to another, particularly if he is occupying what is considered to be his proper niche in the organization for which he works. Vocational education includes many things besides skills, attitudes, and knowledge essential to one employer. It involves general concepts of ethics, human relationships, and public responsibility that are broader than the needs of a single employer. The public, consequently, must maintain programs designed for the interests of the society as a whole.[10]

We agree with all these comments and with the general proposition that the proposed onsite training in industry might very well be organized and coordinated by the community college when there is one available within the community. And perhaps, as general practice, there is a role in this mode of training that must be taken by an institution of higher education even if it must be fulfilled from a distance.

NOTES

[1] James W. Trent and Leland L. Medsker, Beyond High School: A Psychological Study of 10,000 High School Graduates (San Francisco: Jossey Bass Inc., 1968), p. 249.

[2] Grant Venn, Man, Education and Work (Washington, D. C.: American Council on Education, 1964), p. 14.

[3] Ibid.

[4] Ibid. pp. 104-106.

[5] Report of the Panel of Consultants on Vocational Education (Benjamin C. Willis, Chairman) Education for a Changing World of Work. (Washington D. C.: Office of Education, 1963), pp. 152-153.

[6] Norman C. Harris is quoted by Venn, Ibid., p. 14, as specifically emphasizing this need. In Harris' speech to the North Central Association of Colleges and Secondary Schools, Committee on Articulation of Schools and Colleges, March 19, 1963 he states that although business and industry are interested in employees with a high level of general education, "for entry jobs in the American economy today competence and skill of a rather higher order, in some facet of the world of work are absolutely essential."

[7] See for one example Thomas H. Miller, "New Marketing Education Facility at Eastman Kodak," Educational Technology (Training Technology Supplement), (January, 1970), pp. 537-539.

[8] This estimate is based upon the Office of Education estimate of a total of 14,000,000 students in vocational-technical education by 1975 multiplied by the 1967 ratio of post-secondary and adult students to total students (.49), Vocational and Technical Education, Annual Report, Fiscal Year 1967, (1969), pp. 4, 83.

[9] From private correspondance from Ralph Tyler. In this same correspondance Dr. Tyler highly recommends Eli Ginzberg's volume on Occupational Guidance in America "which presents both data and judgements on the problems of occupational choice that are very relevant here." I regret the fact that time did not permit me to secure this manuscript, but the recommendation is printed here for the reader's benefit.

[10] Claude W. Fawcett, "Responsibilities of Non-public Agencies for Conducting Vocational Education," Vocational Education, 64th Yearbook, Part I (Chicago: National Society for the Study of Education, 1965), pp. 251-3.

PART III

SURVEYS OF THE CURRENT SCENE

CHAPTER 14 - INTRODUCTION

This part of the report presents reviews of an extensive literature survey made to assess a number of innovations and changes in higher education. In addition to literature surveys, the assessment involved interviews with administrators and research workers, a mail survey of institutions of higher education, a cost analysis of the operations of a university, and a survey of innovations in the private colleges of California. Although the length of our bibliography may lead one to suppose that we were trying to cover the universe, there was both a definite plan to the literature survey and a distinct limitation. We confined our reading to material that might give us information about efficiency and material that would bear on any one of a preselected list of impending changes or innovations in higher education that were judged to have realistic potential for substantially increasing efficiency. The list was arrived at by paring down a much more inclusive one purely on the basis of our judgments of potential; it may be found on pages 13 and 14 of chapter one.

Some of the items on this list eventually received very little attention, either because they began to look less promising as we dug into them, or because we could not discover much useful information about them, or were not ingenious enough to generate, within our resources, cogent information. For example, assessment of the idea of fragmenting courses was originally thought to be possible by examining the effects of the great variety of short courses for technical and professional people that are so ubiquitous these days. But there seems to be no evaluation of them of any kind anywhere. Even though these courses are often offered by universities through their extension departments, testing of their outcomes seems to be virtually nonexistent. When a test is given at the end of a course, it is mainly a formality intended simply to fill out the traditional format of a course. The justification for these courses is the demand for them; they survive just so long as there is sufficient demand to finance them and no longer. While that may be a satisfactory kind of validation, it provides little basis for analysis.

Another item on the list which receives no attention in the ensuing chapters is that of channeling the public support of higher education through students instead of through the administration; that is, giving public appropriations to students in the form of scholarship grants and letting tuition pay the full cost of higher education. The original supposition was that this policy alternative could easily be evaluated because there are in fact a great many private institutions that are almost wholly supported by tuition. If it is a good idea, one should be able to see in those institutions evidence of greater student participation in decision-making, evidence of higher educational motivation, and hence, evidence of increased academic accomplishment. Yet, it is difficult to find such evidence. For one thing, the kinds of data one would like to have do not exist; for another, the data that do this require all kinds of adjustments and calibrations before one can decipher them. The problem is that we don't really know how to go about making these adjustments because we have too little knowledge of what the data even begin to signify. Thus, we had to conclude that such an investigation was too large for us to pursue within the limits of our study. Our intuitive guess is that, other things being equal, good data referring to the past would not show great differences in academic achievement between colleges with full cost tuition and colleges with large public subsidies. We believe, nevertheless, that giving public funds to students is an excellent strategy for the future. Student exploitation of the power of the purse has probably been small in the past, but now students everywhere are becoming more confident of their judgments and can, in the future, be counted upon to exercise that power more effectively.

Another item on our list, which is not reported on, is the matter of matching students better with colleges so as to minimize apathy, frustration, and to reduce the number of dropouts. This issue is being thoroughly explored by eminent research organizations, (as those attached to the American Council on Education, the College Entrance Examination Board, the Educational Testing Service, the Merit Scholarship Corporation and others), so that we did not expect that our modest allotment of effort would make a significant difference on what already is going on in that area, but we did expect to make some kind of appraisal of what the idea might do for efficiency. Our later posture decreed that it had little promise because (1) we believe students should be mostly part-time students finding their higher education where they happen to be pursuing their careers, and (2) it is incumbent upon institutions of higher education to adapt their resources to the needs of students.

Sadly, we have no report on the idea of transforming students into their own teachers by concentrating on teaching them learning tools. It is an important idea and one that we returned to now and then but we never quite pinned down precisely what we could do about it, short of inventing, de novo, some of the most essential tools. One of them, for example, is a tool which enables an innocent to determine that book A was written by a knowledgeable person whereas book B was written by a charlatan. Until a reasonably clear comprehension can be formed of what such a set of tools might consist of, it is impossible to estimate how much of higher education is susceptible to self learning.

Finally, we have no report on an item concerned with increasing the size of student bodies in order to achieve economies of scale. Somewhat early in the game, we saw an excellent unpublished set of data relating to this matter. It was assembled by Clark Kerr at the Carnegie Commission for Higher Education in order to explore whether there were economies and diseconomies of scale and whether there was an optimum size for institutions of higher education. These data seem not to make any obvious case; cost per student, plotted against size of institution, gives an exceedingly flat curve once one gets beyond the extremely small institutions. It is perfectly clear from those data that no sizable increases in efficiency are going to be found along that route, for it assumes that if smaller institutions increased their enrollments, they would be operated in the same way as larger institutions are now operated. So, if the idea is to make any contribution to efficiency, it must be combined with some ideas for operating larger institutions more efficiently.

The remaining items are reported on in the following chapters, which have quite varied formats depending on the styles of their authors. What was important and not important in each segment of the literature was left to the judgment of each author, although we did agree at the beginning that we would all make a special effort to uncover and include any publication that actually contained quantitative data relating to the change or innovation being appraised. Our agreement arose out of our initial goal to obtain some actual measures and estimates of efficiency. As that goal evaporated, our agreement lost some of its force too.

In addition to the literature surveys, we carried out a mailed questionaire survey of all institutions of higher education to try to determine the extent to which they were concerned with the efficiency of their operations. The returns from that survey are examined in considerable detail in Chapter 21.

There was also a fairly intensive study of the budget of a large university. We wished to discover whether analysis of it would reveal any obvious avenues along which efficiency might be improved. The analysis turned up nothing very exciting, but we include the study in Chapter 23 because it gives a little more detailed picture than one usually sees of university operations from the viewpoint of cost analysis.

Finally, to take out some insurance that we would not overlook something important that might be going on in the real world and not reported in the literature, we interviewed officials of private colleges in California to discover what kind of innovations they were trying out or contemplating. This survey is reported in Chapter 24.

CHAPTER 15

HOW DID WE GET WHERE WE ARE?
(A Short History of Higher Education)

CONTEMPORARY EDUCATION: THE "PERSPECTIVE OF HISTORY"

Why dwell on the past when the present confronts us with such urgent and horrendous problems? The tendency today in considering education is to get together a group of "experts" and start from now: state the problem or goals; weigh the alternative means for reaching those goals, given certain assumptions and criteria; and redesign the system according to the best alternative. A rational approach--and an approach that, according to the record, is likely to fail.

Education is a process woven into the structure of individual personality, and into the very pattern of society. It requires a broad base of support. To snip at it here and try to mend it there is more likely to bring deterioration than change. The goals, the criteria for judging alternatives, cannot simply be lifted out of the intricate pattern of culture by the small precise tweezers of rationality, and new ideas for change cannot be roughly patched in, for the old pattern will remain. Reweaving is intricate, slow business. Changes usually fail to take effect not because innovators failed to make a good--a rational--case, but because the change did not fit in with the overall realities of the time. It is for this reason we look to history, since the problems of today are woven into the complex pattern of the past.

History, by its very nature can only be recorded and interpreted in greatly oversimplified form, and interpretations may disagree. Moreover, American historians have not given much attention to the history of higher education, compared with other events, perhaps because the traditional American hero was expected to make it on his own and education was viewed as detrimental to his progress. Histories of higher education that do exist are generally inadequate in that they tend to consider education apart from the world that surrounds it. They chronical without giving understanding: How did things get the way they are? Are the problems we face new? Can we expect them to change? What lessons can we learn from the past to help us with the future? Over-simplified though it is, one can see, in even this sketchy account of our past, the roots of many of the problems higher education faces today; and hopefully, one may find some guidance. The purpose, of course, is not to replace the "rational" approach but instead, to make it rational in fact.

NEEDED: CHARACTER, NOT INTELLECT

> When I go among them, I don't try to show off my grammar or talk about the Constitution...or make it appear in any way that I am better educated than they are. They wouldn't stand for that sort of thing.[1]
>
> Some young men think they can learn how to be successful in politics from books... In fact, a young man who has gone through the college course is handicapped at the outset. He may succeed in politics, but the chances are 100 to 1 against him.[2]

Though these views came from political professionals at the turn of the twentieth century, they trace back to the beginning of our country. In the election of 1796 when the United States was an agricultural nation, Thomas Jefferson was attacked by Federalist partisans as nothing more than a philosopher: "the characteristic traits of a philosopher, when he turns politician, are timidity, whimsicalness, and a disposition to reason from certain principles, and not from the true nature of man: a proneness to predicate all his measures on certain abstract theories, formed in the recess of his cabinet, and not on the existing state of things and circumstances; an inertness of mind, as applied to governmental policy, a wavering of disposition when great and sudden emergencies demand promptness of decision and energy of action."[3]

What the South Carolina Federalist Congressman, William Loughton Smith, was calling for in this 1796 statement when it seemed that Jefferson might succeed Washington, was character. He was sure intellect was disastrous in politics. Smith contrasted Jefferson to Washington: "Washington," he wrote, "there was a man, no nonsense about him. The great Washington was, thank God, no philosopher; had he been one, we should never have seen his great military exploits; we should never have prospered under his wise administration." [4]

This view was to become standard criticism of the well-educated in politics--portraying the curiosity of the active mind as too trivial and ridiculous for important affairs. Smith felt that Jefferson's merits "might entitle him to the Professorship of a college, but they would be as compatible with the duties of the presidency as with the command of the Western army." [5]

This attitude carried over into the business and vocational worlds when the United States, in the 1880's and 1890's, was on her way toward becoming one of the three great world powers; its remnants still survive in the present, and some fear it may regain strength in the near future.

Colonial America

The history of higher education in America begins with settlement in the 1600's, a time when the educated man was honored and education was valued and encouraged.

The Colonial South--An Education-Free Zone

From the outset, one may pass over the colonial South in this period. It is not that higher education was frowned on by settlers in Virginia, the Carolinas, and Georgia. It was simply that Southerners, in general, simply had no traditional value of higher education--or lower education either. To oversimplify, the South was settled primarily by men who came to the New World alone--men who were seeking a new and better way of life; men who chose to forget their pasts; men who were misfits in their former society. They were men who could only gain by starting out in a New World in which they could make their fortunes and for the first time have a future.

The majority of Southerners who landed before 1630 came without women; thus education of children was not a concern. Moreover, the typical Southerner's life was a 16 or 18 hour day, spent in developing the land, with little time for education. And in the 1630's when women and children began to come to the South, work was still so all-consuming that little thought was given to education. Religion had no firm hold on the Southern mind and there was no powerful established church.

New England: Education the Cornerstone

In contrast to the South, one of the most impressive things about the Puritan community of Massachusetts Bay was the speed with which it founded a college and propagated learning. The first appeal came from John Eliot in 1633, only thirteen years after settlement:

> ...I doe earnestly desire it, if God so move your heart, & not only for the common wealth sake; but also for Larnings sake, which I know you love, & will be ready to furder, & indeede we want store of such men, as will furder that, for it we norish not Larning both church & commonwealth will sinke: God hath bestowed upon you a bounty full blessing; now if you should please, to imploy but one mite, of that greate welth which God hath given, to erect a schoole of larning, a colledg among us; you should doe a most glorious work, acceptable to God & man;...[6]

By 1636, when the little community perched on the edge of a howling wilderness hardly numbered ten thousand, Harvard University was established by an act of the General Court. Instruction began in 1638. In 1650 the General Court devised for the college the charter under which it is governed to this day.

What compelled these New Englanders to establish Harvard? What did they expect to get from the university? The answers are, simultaneously, simple and complicated: religion. Puritanism demanded a literate population: one could lead the so-called good life only if he could follow the Scriptures; he had to read. Puritanism was more than something heard on Sundays; it was a social and political way of life. One could support the structure and contribute to its well-being only if well-versed in the Bible. Literacy was the sustaining power of both the society and government. Education was prized from elemenatry level to university, but the university had its special purposes.

"Renaissance Man" - The Goal of New England Education

It is commonly believed that Harvard and the other early colleges were established as theological seminaries, with the sole object of training potential ministers. In New England's First Fruits, printed in 1643, an anonymous author speaks of the community's dread of leaving "an Illiterate Ministery to the Churches when our present Ministers shall lie in the Dust."[7] But the Puritans did not distinguish sharply between secular and theological learning. They believed that college education for a minister was the same as for an educated layman. They expected early colleges to produce not only ministers, but Christian gentlemen who would be civic leaders.

Harvard's charter referred to the purposes, "the advancement of all good literature arts and Sciences" and "the education of the English and Indian Youth of this Country in knowledge: and Godliness."[8] Even Yale University, established to train men for missionary work, had its aim under its first charter of 1701 the instruction of the youth of Connecticut in the arts and sciences so as to be "fitted for Publick employment both in Church and Civil State."

Contrary to America of the twentieth century, there was no concept of specialization in this period. The well-educated man, minister or layman, was the well-rounded, well-balanced man, intellectually and physically--a holdover of the traditional European view of the "Greek man," or "Renaissance man."

The Harvard statutes admonished the scholars not to "Frequent the company and society of such men as lead an ungirt and dissolute life."[9]

The Yale statutes condemed the student's "Disobedient or Contumacious or Refractory Carriage towards his Superiours, Fight, Striking, Quarreling, Turbulent Words or Behavior, Drunkenness, Uncleaness, Lacivious Words or Actions, waring woman's Apparel,"[10] and listed further crimes warranting punishments. As their English counterparts, American universities had the responsibility for passing on Christian values, and began their tradition of in loco parentis. Colonial records abound with notes about the way parents could not teach their children. It is only recently that the university's disciplinary role has been seriously questioned and rebelled against by students, sometimes with the support of their parents.

England and Her Colonies: An Educational Paradox

American higher education differed from that of England in one important way that seems still to pose a paradox: on the one hand, fervent belief in education, on the other, the refusal to commit adequate funds to its development.

English universities were founded by esteemed scholars. They were attended primarily by the sons of wealthy families, and the schools never lacked money. The wealthy Englishmen was not reluctant to pay for his son's education, for he wanted his son to be a "Gentlemen" and all "Gentlemen" needed a university education in the arts and in morals. English society, as a whole, seemed committed to such schooling. Thus while Englishmen did not believe in universal higher education, English universities did not suffer from lack of support. For this reason the English school could lure great scholars to their faculties; and the more renowned the faculty, the less the school had to worry about support, for the more important the university became.

The story of American universities was the opposite. First, they were established by communities and not by scholars. Second, universal education was deemed essential for the proper functioning of a society and universal higher education was a credo. Third, financial support was not forthcoming from the communities. As a result, the schools were always at the communities' mercy. Sometimes the schools lived from moment to moment. It was a vicious cycle: American universities could not attract scholars because they could not pay them well; indeed, they could not consistently guarantee any salary. Because of this, faculties were staffed with poorly trained, unimpressive men. When asked for more support for their university faculties, the communities generally pointed out the incompetence of the men--or, at least, their lack of academic excellence--and they refused to provide adequate funds. Furthermore, contrary to English practice, it was the communities and not university bodies that governed the universities and set their statutes, thereby potentially limiting academic freedom and restricting the university to be "follower" rather than "leader." Thus, the university in America has always been responsible to the community.

Education for the Damned

The Great Awakening came during the 1730's. To oversimplify, it was the religious leaders' attempt to revive church control in reaction to those seeking to eliminate it. The various New England communities had established churches, in some instances, theocracies (combining church and government into one unit where church and political leaders were one). The reaction was church dominance in every sphere of one's life, and led to demands for the separation of church and state, the rise of secular governments and the call for emphasis on temporal concerns--something the South and West had always had. But not everybody in each New England community agreed. While many were calling for less church dominance in their community, ministers, in an attempt to regain control, were bombarding the community with sermons of hellfire and damnation. People within the same community could not agree on the function of their church; out of all of this agonizing, new religious sects arose.

The implications for the universities were tremulous. First, was the question of which sect should have control in a college or whether university control could be shared, particularly since the colleges were created to propagate the faith through ministerial training. Hellfire and brimstone enthusiasts felt the established clergy, because of its rationality and emphasis on analysis, had grown cold and that the religious slackness of the community had penetrated the colleges. Such charges were leveled against Harvard and Yale for their stress on scholarship and rationality by the Great Awakener, George Whitefield, and led to heated controversy in 1745. The effects of unauthorized (new self-made ministers) enthusiastic preachers upon the minds of undergraduates also became an issue at Yale in 1745, when two students attended Separatist church services with their parents while at home on vacation. Rector Clap of Yale and his faculty upheld the idea that uniformity of faith among the student body must be enforced if the college were to be faithful to the intentions of its founders. The long run arm of university orthodoxy was thus extended outside, beyond the ivy walls, in an attempt to govern the beliefs and practices of students even when they were at home. Thus, the university and its teachings, in this period of the Great Awakening, began to be restricted and influenced by social conflicts and, in fact, was often the focus of them.

Something new was happening in New England society. To use Eric Hoffer's term, the "True Believer" was ascendant, and he existed in two different groups. In each the individual was certain of his righteousness and certain of everyone else's impiety. Those in one group upheld rational, unemotional preaching where one was encouraged to question and arrive at religious conclusions through analysis. They believed deeply in man's Reason and in education to perfect his Reason. Those in the other group wanted to be lured into intense belief through threats of damnation because they believed all men were sinful. To question this, to try to apply analytical methods to religion, was to call down God's vengeance.

Out of this hell-fire group a new kind of minister emerged; he was uneducated, and he attacked education, particularly higher education, (if it was only through higher education that a man could become a minister, he would be excluded). His credentials were his overpowering oratory and emotional appeal, which, through groveling and howling, made converts at evangelical revivals. He was also preaching a new kind of religion--the beginning of the Methodists, Baptists and Fundamentalists in the United States. But the new minister's appeal lay in his ability to "reach the common people" where well-educated ministers had failed. The justification for the preaching was later well articulated by that indefatigable saver of souls, Dwight L. Moody: "It makes no difference how you get a man to God, provided you get him there."[11] A minister's wisdom came to be measured by the number of converts he made; the Bible said in Proverbs XI, 30, that "He that winneth souls is wise."

Because of inadequate statistics, it is impossible to know how many New Englanders moved over to the new style of religion. We do know, however, that Southerners and Westerners, people who had never cared about religion, were suddenly concerned about the possibility of damnation and were taken by the promise of salvation.

Education and Democracy

Incompatible? The Great Awakening did not kill the impulse to develop colleges and universities. In fact, Brown, Rutgers, and Dartmouth were founded by men dominated by that movement. But these colleges were established for different reasons from their predecessors. What their ardent, religious, factionalist founders wanted was not so much centers of learning, but instruments for inculcating approved ideas. Thus, an enormous gap developed among people who were concerned about the purpose of higher education and it is with us today.

On the eve of the American Revolution, the Great Awakener conviction seemed to signify democracy. Great Awakeners believed man instinctively chose "right" and education confused him and rendered his natural good instincts inoperative; education destroyed the basic godliness of the individual; for it taught him to choose what he desired and to develop all sorts of rational excuses as to why it was good. The Awakeners' was a leveling philosophy, it made the uneducated man equal, and even better than the man with education. Moreover, because it was mainly only the wealthy who could let their sons take time away from work and attend the university, Awakener ideas appealed to those who believed education perpetuated the class system. It was commonly held that education fostered the antithesis of democracy. William Manning, a plain New England farmer of that time, pointed up a basic issue that still persists when he wrote, "Learning and knowledge is essential to the preservation of Libberty & unless we have more of it amongue us we Cannot Seporte our Libertyes Long."[12] At the same time, he had a profound suspicion of the learned and property-holding classes. He believed they could and would manipulate social institutions for their own benefit; he believed all men must partake of education in order to protect themselves from the educated and wealthy. We hear the same argument today from minority groups who demand admission to higher education so they can learn how the rules of the social and economic games really operate.

The United States during the Revolutionary period and throughout most of the 19th century was constantly on the move--a country with land that needed settlement, where a man with physical fortitude and stamina could "make it" without education, where, in contrast to today, most felt education was, in reality, a detriment to success.

After the American Revolutionary victory, there were those (mostly those with money) who wanted their sons to be educated and who knew that the success of the new nation depended on a good college system. They also believed that to send American youth abroad for education would be a "humiliating acknowledgement" of "ignorance or inferiority" of their new country. Thus, in the South, the University of Georgia was chartered in 1785, soon followed by the University of North Carolina, the University of Tennessee, and the South Carolina College (later the University of

South Carolina). The state university idea spread westward. In Michigan the legal foundations of a university were laid under the Northwest Ordinance, in 1817, twenty years before Michigan became a state.

The Old Question: What Should Be Taught?

From the close of the Revolution through the first two decades of the 19th century, there was much searching for educational theory. Liberals such as Benjamin Rush hoped to make American education more secular and scientific, more general and practical, and cut through the bounds of the traditional classical college with its sectarian scholarship. As enunciated in his call for a Federal University in 1788, Rush wanted the university to teach

> ...the principles and forms of government, applied in a particular manner to the explanation of every part of the Constitution and the laws of the United States, together with the laws of nature and nations, which last should include every thing that relates to peace, war, treaties, ambassadors and the like.
>
> ...The principles and practice of manufactures. The history, principles, objects and channels of commerce.
>
> Those parts of mathematics which are necessary to the division of property, to finance, and to the principles and practice of war, for there is much reason to fear that war will continue for some time to come, to be the unChristian mode of deciding disputes between Christian nations.
>
> Those parts of natural philosophy and chemistry, which admit of an application to agriculture, manufactures, commerce and war.
>
> ...it will be necessary to establish a museum, as also a garden, in which not only all the shrubs, &c. but all the forest trees of the United States should be cultivated.
>
> The German and French languages should be taught in this University. The many excellent books which are written in both these languages upon all subjects, more specially upon those which relate to the advancement of national improvements of all kinds, will render a knowledge of them an essential part of the education of a legislator of the United States.

> ...All those athletic and manly exercises should likewise be taught in the University, which are calculated to impart health, strength, and elegance to the human body.[13]

Rush also advocated sending four young men of good education to travel, at public expense, to collect information and knowledge about advancements in Europe so that our educational system could be meaningful.

George Washington, more than once, had proposed a national university to Congress as an aid to national unity, on the ground that "the more homogeneous our citizens can be made in (principles, opinions, and manners), the greater will be our prospect of permanent union."[14]

But the national university never came to be. Thomas Jefferson, representing those who favored decentralized federal government, put his hopes on the states as the sponsors of higher education. In short, even those Americans who believed fervently in the need for higher education were divided over the issue of centralization.

Who Should Control the University? - Dartmouth College Case

Dartmouth became involved in state politics in 1816 when the Jeffersonian Republicans reorganized the college, under a revised charter, as Dartmouth University. The college trustees refused to abide by the law and kept a college operating in Hanover side by side with the newly created institution. The Jeffersonian Republican court of New Hampshire decided that the newly created Dartmouth was the valid one, but the college trustees appealed to the Supreme Court. Before the Court, Federalist Daniel Webster eloquently argued that the Dartmouth charter was a contract and that the attempt to change it violated the Federal Constitution. He further argued that the college would be in constant danger if it were to be subject to change by public opinion or party politics. In a momentous decision, Chief Justice John Marshall agreed with Webster. This decision had profound consequences for all corporations, including business enterprises. For education it meant private colleges, once chartered, would be secure from state interference. Small colleges soon began to mushroom throughout the nation.

Probably the majority of Americans who were living in the West were unaware of the Dartmouth case. It is likely that the "new American"--the "man of the West"--would have been opposed to Marshall's decision, for he would have viewed it as simply one more example of wealth controlling the nation.

Like the Southerner of the 1600's, the Westerner was escaping--he was fleeing Eastern and Southern society where he had been unable to "make it," and the new land of rugged terrain and Indian raids left him with few interests outside mere survival. Further, the Westerner had become tuned to the religions of the Great Awakening. He believed that it was sinful to question; he believed in his instinctive ability to make correct choices. Sheer physical endurance was what counted. These were people who, for the most part, could not read even the Bible and felt it a waste of time to learn how. Even the missionaries, at times, were overwhelmed, as was Colin B. Goodykootz who wrote of his difficulties in the town of China, Indiana:

> Ignorance & her squalid brood. A universal dearth of intellect.... There is not a scholar in grammar or geography, or a teacher capable of instructing in them....Parents and children are one dead level of ignorance....Master Ignoramus is a striking fascimile of them....Of course there is no kind of ambition for improvement; & it is no more disgrace for man, woman or child to be unable to read, than to have a long nose....[15]

But men and women living under conditions of poverty and brawling could not afford education and culture and they found it easy to reject what they could not have.

Jacksonian Democracy: Support for the "School of Hard Knocks"

As a result of the rise of the West and its control over the political balance of power throughout the 19th century, education on all levels received little support. The classic illustration was the election of 1824 between Andrew Jackson and John Quincy Adams. John Quincy Adams was the last President to stand in the old line of government by gentlemen. In the election, he became the symbol of the old order and the victim of the reaction against the learned man.

Adams had studied in Europe as well as at Harvard. He had held Harvard's chair of rhetoric and oratory; he had aspired to write epic poetry; and he had headed the American Academy of Arts and Sciences for many years. He believed that if the new republic failed to use its powers to develop the arts and sciences, it "would be treachery to the most sacred of trusts."[16] It was his hope--as it had been Washington's, Jefferson's, and Madison's--that the federal government would act as the guide and center of a national program of educational and scientific advancement. In his first annual message to Congress, Adams proposed a system of internal improvements advantageous to business interests, he also asked for several things desired chiefly by men of learned classes: a national university at Washington, a professional naval academy, a national observatory, a voyage of discovery to the Northwest to follow upon the Lewis and Clark expedition, an efficient patent office, federal aid to the sciences through a new executive department.

In this, Adams offended the people to whom Jackson appealed--and they were the majority of the people. He was the last 19th century occupant of the White House to believe that fostering the aspirations of science and higher education should be a function of the federal government.

Against such a primitivist hero who brought wisdom straight out of the forest, Adams, with elaborate education and experience at foreign courts, seemed artificial. Even when Adams won the freakish 1824 four-way election, Jackson was, by far, the most popular candidate; and, in 1828 when Jackson returned to challenge Adams, there was no doubt of the outcome. Adams was outdone in every section of the country but New England. It was a contest between

> John Quincy Adams who can write
> And Andrew Jackson who can fight.

It was the beginning of the age of "Jacksonian Democracy" in which any man was suitable to any calling, for he had natural instincts that would guide him properly. So-called aristocracy was paired with sterile intellect, and democracy with native intuition and the power to act. A premium was placed on the man who could communicate with the "common people"--an age in which folk heroes like Daniel Boone and Davy Crockett became kings. It was an age in which lack of education was something to boast about. And the nation left higher education to fend for itself.

What is Higher Education For?

While Jacksonianism pervaded the minds of the majority, American educators were grumbling about the inadequacy of the college system. There seemed to be no communication between the men who believed in education and the masses who opposed it.

In the early 19th century there were some Americans studying at German universities, the most rapidly developing universities in the world. Their experiences brought into focus what higher education could be, how lacking American colleges were. George Ticknor, a scholar returned from Germany, received a post at Harvard from which he tried to reform Harvard's curriculum. He proposed the college be divided into specialized departments. His colleagues rejected his proposals, and, after fifteen years of agitation for change, Ticknor resigned.

At Yale the attitude toward reform was the same. Julian M. Sturtevant, later to become an outstanding educator, noted that Yale's power to develop the mind lay in "tough drill" but did nothing more advanced or imaginative. The two great things to be accomplished by education, the Yale faculty believed, were "the discipline and the furniture of the mind"---developing the mind's powers and filling it with knowledge. The more important was presumably the mental discipline. For this, they argued, nothing was superior to the study of the Greek and Roman classics "especially adapted to form the taste, and to discipline the mind, both in thought and diction, to the relish of what is elevated, chaste, and simple." 18

In spite of such stands, proposals for innovation were constantly being brought forward to change the backwardness of the typical American college. Many promoters of education felt that New York City was a natural site for a distinguished university—a role that Columbia failed to fulfill. A number of teachers were brought together at a convention in New York in 1830 to synthesize the leading criticisms of the college and to formulate proposals that would help in the foundation of a serious center of higher studies. They weighed the limits of the existing curriculum, the possibilities of graduate study, the status of the professor, the problem of academic government, and the advantages of an urban university. Unfortunately, New York University, chartered in 1831, like so many other educational experiments of the period, disappointed its founders. It became a hotbed of controversy, and soon lost a number of its best professors.

Dissatisfaction with the colleges led some critics to question the way in which they were controlled. One of the most formidable critics, Jasper Adams, the president of Charleston College, felt the blame should rest upon the boards of lay trustees who had "almost no qualifications which peculiarly fit them for the practical administration of these institutions."[19] He pointed out that colleges tended to improve in proportion to the extent they were allowed by their trustees to be run by presidents and faculties in all matters bearing upon discipline and instruction.

"Promise Not Performance"

Educational criticism quickened in the years 1850 and 1865, the year Cornell University was chartered. Most educators came to agree with Francis Wayland's arguments that the collegiate system did not serve the community's needs for scientific, practical, or advanced study. Henry P. Tappan wrote, "Education has become superficial by attempting too much in the short period allotted. We inspire no general desire for higher education," he bemoaned, "and fail to attract college students, because we promise and do not perform."[20] Other critics, like F.A.P. Barnard, criticized the cramped parochialism of the small custodial college. He said the whole country must "abandon the cloister system entirely, and with it the attempt to do what is now done only in pretense; that is, the attempt to watch over the conduct and protect the morals of the student."[21] In short, he wanted an end of college as merely an extension of the secondary school.

Attacks were made by sectarian colleges against Cornell for its experimentation, but it was supported out of the technological needs of agriculture and business. The Morrill Act in 1862 gave federal aid to agricultural and mechanical colleges when education in new techniques was seen as a partial answer to the farmer's problem. This was a case where government was a leader rather than follower in education. But, the farmers were the last to believe education was an answer to their problems, and they laughed at book learning. The only way to learn about the land was to work it!

Excluded from the regular colleges, science had been entering education by the back door in the form of separate technical schools, beginning with Rensselaer Polytechnic Institute in 1824, Harvard's Lawrence Scientific School, Yale's Sheffield in 1847, and Dartmouth's Chandler School of Science and Arts in 1851. The Massachusetts Institute of Technology was chartered in 1861. These scientific schools were entering into competition for students with regular colleges and challenged the older educational philosophy. All of these scientific schools benefitted from the Morrill Act.

Women's Colleges

Higher education was provided for women in parts of the country before the Civil War, on a private, denominational basis, where academic standards were high and instruction was similar to the Eastern men's colleges of the time. Elmira Remal College was founded in 1855, Vassar Female College ten years later, both in New York State. Co-education had started at Oberlin Collegate Institute (1833) and Antioch College (1853) in Ohio, and at the State Universities of Utah (1850), Iowa (1856), and Washington (1862). But it was not until the first Morrill Act, which came at a time when women's rights were being demanded (at the time of the Greenback and Granger reform movements), that women were included as students at state universities on a broad scale.

Civil Service: A Barometer of Education Attitudes

While educators continued to experiment with new ideas and setting up new colleges, the bulk of American society was still opposed to higher ecucation. During the Gilded Age, about 1875-1900, corruption of business and government led reformers to call for governmental regulation to protect the general welfare. They demanded that civil service examinations be given to candidates for jobs so the Spoils System could end. These reformers were basically from old New England families; they were wealthy and well-educated. They were generally regarded as men who were trying to regain their old influence in American society and were barred from strong political alliances, condemned to ineffectuality. "We want a government," said Carl Schurz in 1874 speaking for the group, "which the best people of this country will be proud of."[22] They were asking for leadership by an educated and civic minded elite--in a country which had no use for elites of any kind, much less for an educated one. And, there was no doubt that their political ideas were not in tune with the general sentiment. They wanted government to protect men at a time when "survival of the fittest" was the social gospel.

In calling for civil service reform and open competition on the basis of merit with what the politicians and people called a "schoolmaster's test," the reformers touched off a violent reaction which brought forth a flood of anti-intellectual and anti-education demagogy. The professionals denounced the idea as aristocratic and imitative of British, Prussian, and Chinese bureaucracies; as a threat to republicanism; and as militaristic because the proposal took as one of its models the examination requirements from the armed services.

Professional politicians feared that the demand for competence, literacy, and intelligence would threaten the spoils system. A Congressman from Indiana held up this frightening prospect: A graduate of Washington College in Virginia would do better on a competitive examination than a disabled soldier of some "common school or workshop of the West, who lost a limb at the battle of Chickamauga." "The people," he said, "are not quite ready to permit the student of rebel colleges...to supersede the disabled and patriotic soldiers of the Republic, who with fewer educational advantages but larger practical experience are much better fitted for the position."[23]

In similar terms, Senator Matthew H. Carpenter of Wisconsin declaimed that during the Civil War

> when the fate of the nation was trembling in the balance and our gallant youths were breathing the storm of war, the sons of less patriotic citizens were enjoying the advantages of a college course. And now, when our maimed soldiers have returned, and apply for a Federal office, the duties of which they are perfectly competent to discharge,they are to be rejected to give place to those who were cramming themselves with facts and principles from the books, while they were bleeding for the country,...24

Another opponent to Civil Service exams put it as creating

> ...a class separate from the rest of the community, and bound together by a common interest and a common subordination to one man, he also the commander-in-chief of the Army--the President of the United States. 25

The reformers protested that there was nothing undemocratic about tests open to all applicants, but in vain. Had it not been for the assassination of President Garfield, which dramatized the corruption of the country, it is likely that the reforms of the Pendleton Civil Service Act would have been delayed for at least another generation.

"TR": Educated but a "Man's Man"

Politicians, invoking the well established image of the American male, argued that culture was impractical and feminine, and men of culture were "namby-pamby, goody-goody gentlemen" who "sip cold tea" and were ineffectual.[26] Senator Ingalls of Kansas denounced the reformers as

> ...the third sex...effeminate without being either masculine or feminine; unable either to beget or bear; possessing neither fecundity nor virility; endowed with the contempt of men and the derision of women, and doomed to sterility, isolation, and extinction.[27]

It took the election of Theodore Roosevelt to prove that a man could be a "man's man" and still be well-educated.

Roosevelt came from the same social and educational strata as the reform leaders, but he had decided at an early age that if reformers were to get anywhere, their image would have to be replaced by a new, more vigorous kind of leader from the same class. When he first entered the New York Assembly, he suffered from the stigma of his fashionable background: he came from wealth; he was a Harvard man; he wore eyeglasses; he spoke in the style of first families of New York; his voice was high-pitched. But his vigor and sincerity began to win favorable notice. His familiarity with the West and his ranching experience helped to establish his virility. He was described as a "manly, athletic, vigorous person...fond of hunting big game in the Far West..." and "schooled in the art of self-protection during his early days of roughing it in the West."[28] Heroic tales were even told of his experiences with the Indians. Against the urban, commercial, cynical world, Roosevelt represented the West and the outdoors and a sincere and idealistic outlook. He had begun to show that the educated man had a useful part to play.

Shift Toward Academic Freedom

While the reformers were seeking to improve politics and society, universities were changing. They found themselves with financial support from private donors that gave them financial stability; they added scientific studies to their curricula; they established the departmental system; and, by 1900, they had abandoned the traditionally required classical curriculum and left the undergraduate comparatively free to determine his own course of study by creating the elective system. This new freedom of spirit encouraged the student to single out areas of special interest in which he would go on to do work of distinction. Because the choices were his own, he would form his own habits of work and guide his own conduct.

Needless to say, the elective system came in for a great deal of debate and met opposition from many traditionalists, including James McCosh of Princeton and President Noah Porter of Yale. The elective system also posed tangible problems: students' choices of study were often unbalanced, and the lecture course which replaced previous rote learning raised the question of compulsory attendance and other issues. But in spite of the problems in the last twenty years of the 19th century, college presidents were given a free hand by trustees in recruiting faculties and certain other matters. Trustees soon found that the more eminent the faculty, the more it was likely to claim an active role in managing academic affairs. The trustees found their new role to be financial management, while college presidents and their faculties came to deal with everything from curriculum to student discipline. The professor rising in status began to ask if trustees' powers should not be even further curtailed, but he soon learned that trustees had law and tradition on their side, along with powerful elements in the community.

Professors, however, did not give up to the trustees on the question of academic freedom. A classic case was that of William Graham Sumner, one of the most effective and popular teachers in the history of Yale. In the early 1870's, Sumner was using Herbert Spencer's book, The Study of Sociology, as a textbook for undergraduates. President Porter, though not an opponent of evolution, felt Spencer's book, with its militant secularism, was unsuitable. Sumner stood his ground, circulating a vigorous letter of appeal to the trustees, and won. He had demonstrated the power of the professor to appeal on the basis of scientific value to justify classroom procedure.

Rights of property, socialism, labor, currency, and other economic questions were also sources of intense academic controversy, particularly with the Panic of 1893. Despite the hysteria over questions about the validity of the American economic system, academic freedom was preserved, at least for the time being.

Industrialization: The Rise of the Expert

By 1900 the needs produced by the new technology, industry, and commerce undermined the traditional liberal arts curriculum. The focus was on specialized scholarship, advanced degrees, and professional training. The pressure threatened to make the traditional liberal education extinct.

Educators faced formidable questions: How to adjust the competing claims of quantity and quality, of democracy and excellence, of the professional, vocational and liberal education? How many subjects should be taught in an age of specialized knowledge? Is there any longer a common body of knowledge to which all college men and women should be exposed? What kind of liberal arts curriculum is meaningful in an age of specialization? How much common organization and how much individual choice should such a curriculum provide?

These questions, implicit in any system of education, and posed so sharply in America at the turn of the century, would continue to rise, submerge, and rise again as the country passed through storms of war, depression, more war, new technology, new waves of fear and intolerance, rising expectations and civil crisis. Meanwhile, helped by Theodore Roosevelt and a good press, the educated expert was becoming widely accepted by the public. Brander Matthews in 1909 noted it was

> ...an evidence of common sense of the American people that the prejudice against the College Professors, like that against the men of letters, is rapidly dying down, and that there is beginning to be public recognition and public appreciation of the services they are rendering to the Commonwealth...It is partly due to a growing understanding of the real value of the expert and the theorist.[29]

With World War I, the need for educated experts of all kinds could not be denied by even the most conservative. Production had to be speeded up, consumption had to be cut down, new weapons had to be devised, government propaganda had to be issued, wage and price controls had to be developed. parts of industry had to be nationalized. All this required educated men. Questions and debates among educators about the fundamental questions of higher education took second place. Those who advocated professional education and the elimination of liberal arts programs won out, as it was the trained expert the war required.

"Normalcy:" Return to Anti-Intellectualism

The post-war 1920's did not encourage debate either. In their desire to return to "normalcy," not only did Americans want to avoid "entangling alliances," but they wanted to avoid their own nation's problems of readjustment. They were deeply disillusioned by the War. They wanted little to do with higher education; they wanted to return to their "natural" selves.

The Roaring Twenties also saw a new wave of intolerance, particularly in the South, Middlewest and the West. The Ku Klux Klan, lynchings of Negroes, Catholics, Jews, and even some aliens; Red scares; Attorney General Palmer's order to the FBI to go after "radical aliens;" a new restrictive immigration law; the questionable trial of Sacco and Vanzetti; the Tennessee Scopes Trial based on notions which rejected science; and hostility to foreigners, intellectuals, and urban society--these were the general signs of the times.

Yet, while the Roaring Twenties' people sought a way back to the "good old days," society was becoming dependent on the gadgetry of the new, and reflected deep social change.

Depression: A New Limited Partnership of Government and the Educated

Then came the 1929 Crash, the Great Depression. Businessmen pushed for laissez-faire as the way to let the economy "work itself out;" labor wanted higher wages and regulation of business without concern for the effects on business. President Franklin Roosevelt believed that men of higher education were the nation's only hope, for they could offer solutions without an axe to grind. Thus, he gathered together his "Brain Trust." The public was generally suspicious of the intellectual and charges were made that it was not the President or his Cabinet who were running the country but the so-called intellectuals.

An Unsettled Partnership

World War II began a dramatic new chapter in higher education, the climax of which we may well be living through today.

What started on a tiny scale in World War I--the working relationship between the university and government in wartime activities--rapidly bloomed on a grand scale. Major universities--facilities, faculty, and advanced students--became the development grounds for the spectacular art of modern war: the atom bomb (University of Chicago, University of California, Johns Hopkins), radar (The Massachusetts Institute of Technology), the electronic computer (University of Pennsylvania). Economic planning, propaganda, intelligence, even tactical military planning came under the minds and hands of university scholars. Scholars and government became full partners and the results were impressive.

Even before the war came to a close, plans were laid to protect this partnership, particularly when it became clear that victory would not be the end to the country's military and economic problems. The war brought the United States to a new position of world leadership, for suddenly she had awsome responsibilities for rebuilding large areas of the world. It also brought to the fore the spectre of an aggressive competitor, the Communist Bloc. As the war approached its end, most academics were anxious to leave their wartime adventure for the campus. But, there were a few in the military and other offices of government who felt it would be almost criminal negligence to dissolve the partnership that had been so successful. It was out of such concern that the first "Think Tank," a small group of academicians, including mathematicians, economists, engineers, and political scientists, was organized; it was supported for long-term research by the Air Force. This would soon become the non-profit RAND Corporation, and grow to a professional staff of almost a thousand.

The most important feature of RAND was its interdisciplinary approach to problems; experts in diverse fields, from anthropology to physics, worked together on urgent problems that were clearly too complex to be handled within any one area of expertise. Universities seem unable to perform interdisciplinary research of any consequence. The reason is probably that the traditional authority-reward structure in the university remained within narrow departments; scholars in different disciplines seldom talk to each other, and almost never work together for an extended period. Though universities have formed their own research centers, this crippling limitation is still in force. It is probably for this reason, more than any other, that the federal government has created a number of other RAND-like organizations.

Since the end of World War II, the filagree of relationships that has developed between research corporations, government, university research centers, government grants to individual faculty members, private business, and other elements has become so intricate that it will be a long time before its full implications become clear.

The Call for Mass Higher Education

The end of World War II brought another big change to the universities. Under the GI bill of rights, returning veterans were offered pay to educate themselves. This sent hundreds of thousands of young men back to college. These men were older, came from virtually all levels of society, and, in many other ways, differed from the regular students. Professors were delighted with the maturity, variety, and discipline of the GI's. Most seemed to know where they wanted to go and were willing to study hard to get there. But these new students, combined with those produced by the heterogeneous-mass high school and the elective system, undermined the old ideal of a liberal education.

Junior colleges boomed as a result of the GI bill. The nation's first junior college had been founded in Joliet, Illinois, in 1902; their early growth occurred particularly in Texas and California. After World War II the junior college began to multiply in the form of community colleges where the student could find a school close to where he lived, without the added expense and inconvenience of living away from home. The two-year school was free to any state resident, so a student was not deterred from higher education for financial reasons. Also, the junior college was open to anyone and everyone over 18 years old and a high school diploma was not required for entrance. This meant that a student who had failed in high school could find a "second chance," and eventually enter a four-year college. For many the junior college was chosen as a way to dampen the trauma of the transition from high school to university. Finally, the junior colleges, because of their range of curricular offerings, could serve almost any student during his initial college years--the one with high academic aspirations as well as the one seeking training.

The report of President Truman's Commission on Higher Education suggested that education had moved into a wholly new dimension; it asserted that the new goal of higher education was to accumulate large numbers of students. The report aroused great controversy, for many felt the new numbers of college educated people set forth by the Commission were not needed by the American economy. Others objected that the Commission proposed to sacrifice quality for quantity.

Also at the end of World War II, the "managerial revolution," fostered by the growth of large corporations, was firmly entrenched. College popularly became a good place to "meet the right people," "make contacts," and "prepare for a good job" so that one would not "have to start at the bottom and work up." Given this attitude and the easy access to higher education, men without degrees had to "start at the bottom" and the historical belief that anyone without an education could "make it to the top" faded.

Meanwhile, controversy about the Truman Commission's report abounded; this, combined with a reaction against the New Deal and the Second World War "takeover" by experts, threatened the working relationship between the well educated and popular democracy. Once again, as in the twenties, America in the fifties depended on the products of higher education, and resented it. More violently than the twenties, though, colleges and universities and their faculties were dragged into the mire of political demagoguery. When Senator Joseph McCarthy charged that colleges and universities were dangerous hotbeds of Communism, many of those even within the university believed him. More insidious than any of the anti-intellectualism and anti-educationism of the past, the McCarthy Era almost indiscriminately equated educated people with treason. The colleges and universities retreated; though they craved academic freedom, they were afraid. Thus, instead of leading the public in condemnation of McCarthy and his followers, they meekly accepted loyalty oaths for their personnel and waited quietly--indeed, college and university students of the fifties were so quiet, they have been labeled "the Silent Generation."

In 1952, Adlai Stevenson illustrated the times, for he became the victim of the accumulated grievances against intellectuals and experts which had been festering since 1933. Because of his obvious intellectualism, Stevenson was described as "soft on Communism." He had no chance against the charisma of a world renowned General, Eisenhower. Americans felt threatened by another world power, the Soviet Union. Like the Jacksonians and the Gilded Age politicians, they were convinced that it wasn't education they needed, but physical might and nerve, a leader who could act, not merely think. General Eisenhower was chosen to meet the over-simplified "needs" of the country.

As the 1950's came to a close, Americans were shocked into massive reassessment of their attitudes toward higher education. The Russian launching of the first satellite caught them short; it seemed to make the Russian threat direct and immediate. They saw the threat as coming from science, and science meant education. The anti-intellectual and anti-expert traditions were shaken to their roots. For the first time since colonial New England, education on all levels was recognized as essential to survival.

Problems of education were no longer restricted to debate among educators; they became subjects of popular conversation, from government offices to barbershops. Books about education proliferated; their authors ran the gamut from educators to military officers. Everyone had something to say about education. Everyone seemed to be asking how America's education system could be so deficient as to allow a scientific threat to its security. Political leaders promised immediate action, and committed government funds on a large scale.

The university, which historically had held a place at the perimeter of society, was pushed to the center. Perhaps even the people's choice of president in 1960 illustrated the depth of the change: John F. Kennedy brought back to presidential politics the image of both intellect and physical stamina reminiscent of Teddy Roosevelt. Kennedy brought into government intellectual talent at all levels; furthermore, he paid them the honor of official recognition by including them in White House functions. With Kennedy as its tangible incarnation, the man of higher education suddenly achieved new status. It appeared that the only sure way to reap the full benefits of American opportunity was through university education.

One of the most influential forces for educational change during recent times has come from foundations. Foundations had been established long before the 20th century (e.g. the funds established by Benjamin Franklin in 1791 to assist "young married artificers" of good character, and The Magdelan Society of Philadelphia set up in 1800 "to ameliorate the distressed condition of those unhappy females who have been seduced from the paths of virtue, and are desirous of returning to a life of rectitude").

But it was not until the 20th century that the foundation idea began to take deep root in America. In 1902, Andrew Carnegie established The Carnegie Institution of Washington, "to encourage, in the broadest sense and most liberal manner, investigation, research, and discovery, and the application of knowledge to the improvement of mankind." Within a few years were established The Carnegie Foundation for the Advancement of Teaching, followed by the Russell Sage Foundation, The Carnegie Endowment for International Peace, The Carnegie Corporation of New York, The Rockefeller Foundation and others. In 1936, The Ford Foundation was incorporated, destined to become the largest of all foundations. By 1960 it had distributed more than $1,000,000,000 in grants, about two thirds of which had gone to education.

But the value of the support from the foundations was less in the size of its funding than in the uses to which funds were put; for example, the research and pilot projects and fundamental attempts at education and change could not have surfaced in the educational establishment without this help from outside. Moreover, foundation support on specific research problems and broad programs in the physical and social sciences (the larger share of which was carried out at academic institutions) had a profound effect on increasing the store of knowledge and quality of faculty available to students.

Foundations have also been a substantial factor in increasing educational opportunity through their programs for assisting minority students and students from poor families directly and through their support of public programs to achieve the same purpose.

Between 1960 and 1967, total enrollment in institutions of higher education more than doubled. Regardless of family background, everyone was beginning to want better education. The federal government created scholarship and loan funds for students who could not afford higher education; all sorts of federal projects emerged in an effort to discover academic potential that might otherwise ge untapped because of minority status.

Federal financial and moral commitments to higher education did not develop umimpeded, however. There were too many traditions and too much folklore to overcome. First, the more the federal government contributed to higher education and the more college and university doors were opened to students who traditionally would have been excluded, the more problems emerged. Scouting academic potential at minority schools and enabling disadvantaged students to go to college, created new hopes and expectations, within minority groups. Minorities began to realize that their lot would improve only through higher education. They demanded special admissions policies and special programs at colleges and universities. The new opportunity given to some began to be demanded for all. Though their demands made sense to them and their supporters, they looked more like revolutionaries to a sizable segment of white, middle-class America. Federal programs sponsoring minority admission to higher education began to be scathingly criticized; many Americans seriously questioned the use of their taxes in this matter.

Second, as federal participation in higher education accelerated, the old issue of states' rights vs. strong central government revived. Only the federal government had adequate financial and expert resources to support necessary large-scale education programs. Again, it was the issue of reality vs. tradition. At a time when reality dictated federal participation in higher education, the traditional anathema of "strong central government" began a renaissance; calls for "local home rule" made some state leaders in the nineteen sixties sound like late 18th and 19th century Jeffersonians.

Third, student unrest developed on campuses, the reasons for which are perhaps still unclear: the affluence of the young; the federal support which allowed so many to be educated; the Cold War; Vietnam; military research on campuses; the resurgence of idealism? Students were calling for "relevance;" students and, later, faculty were calling for an end to the undeclared war in Vietnam; students and faculty were criticizing American traditions. The American public's hackless were being raised; public reactions in the late '60's and 1970 seem to be coming full-cycle: the very existence of large-scale higher education is being challenged once again.

NOTES

[1] William L Riordon, Plunkitt of Tammany Hall (New York: E. P. Dutton and Co., 1948), pp. 60-61.

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[3] Richard Hofstadter, Anti-Intellectualism in American Life (New York: Knopf, Inc., 1969), p. 147.

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[6] Richard Hofstadter, and W. Smith, American Higher Education, A Documentary History (Chicago: University of Chicago Press, 1961), p. 5.

[7] *Ibid*., pp. 6-7.

[8] *Ibid*., p. 10.

[9] *Ibid*., p. 13.

[10] *Ibid*., pp. 39-49.

[11] Richard Hofstadter, *op*. *cit*., p. 85.

[12] *Ibid*., p. 152.

[13] Richard Hofstadter, and W. Smith, *op*. *cit*., pp. 152-57.

[14] *Ibid*., pp. 157-159.

[15] Richard Hofstadter, *op*. *cit*., p. 78.

[16] *Ibid*., pp. 157-158.

[17] John William Ward, Andrew Jackson: Symbol for an Age (New York: Oxford Press, 1955), pp. 31, 49, 52, 53, 68.

[18] Richard Hofstadter, and W. Smith, *op*. *cit*., pp. 275-91.

[19] *Ibid*., pp. 311-328.

[20] *Ibid*., p. 488.

[21] Ibid., p. 511.

[22] Eric Goldman, Rendezvous with Destiny (New York: Knopf, Inc., 1952), p. 24.

[23] Richard Hofstadter, op. cit., p. 182.

[24] Ibid., pp. 182-83.

[25] Ibid., pp. 184-85.

[26] Ibid., p. 188.

[27] loc. cit.

[28] Ibid., p. 194.

[29] Ibid., p. 206.

[30] Ibid., p. 255.

CHAPTER 16

OPTIONS AND ISSUES CONCERNING GRADING IN HIGHER EDUCATION

INTRODUCTION

To "grade" is to position along a scale, or to rank in order, or to sort into categories. What does grading have to do with educating?

Whether or not grading is antagonistic to educating, or essential to it, or simply congenial to it, is a question that we must consider shortly. But there is a prior question. Which do we really want from our higher education efforts: grading or educating?

This question, or rather this choice, is too utterly consequential to be lightly set aside. Too often we simply dismiss this question by invoking virtuous and fatuous sentiments in favor of educating, on the one hand, or by resigned acknowledgement of the inevitability of grading, on the other. Either answer is an evasion. It is no doubt true that our higher education system will continue to blend both objectives: grading and educating. But there remains the all-important question about the proportions of the blend. After all, the difference between a reading lamp and a cook stove is only a matter of proportion--not to mention the difference between a bright scholar and a hot chef.

Of course, the choice of emphasis between grading and educating is not a choice that any one decision-maker will make. Students, faculties, administrators, employers, government officials, the general public, all will have their measure of influence on the choice. The issue will be decided by the balance of many, many pressures. Perhaps it is partly for this reason that the choice is typically ignored, or at best skirted, rather than faced head-on. The choice is not of the type that becomes the central issue in a national political campaign or in a decision to hire or fire a college president.

But there is another reason why the choice is ignored. The choice exposes embarrassing conflicts between the professed purposes of the higher education system and the real motivations of the varied participants in the system. As with so many vexing social choices, the older generation is not so uncomfortable with the situation that it feels any great need to explore the choice directly and with candor, and the younger generation lacks the commitment to discuss the choice reflectively and with honest sophistication. The choice awaits serious attention. To what extent is educating the function of the higher education system, and to what extent is grading the function?

TERMINAL GRADES

To help us consider this question, and to perceive the options available to us for promoting efficiency through modifications of our grading habits, we will categorize grades into three types:

1. Terminal grades--grades given at the termination of any formal educational program.
2. Admission and continuation grades--grades used to determine eligibility and priority for admission to educational opportunities and for continuation in educational programs.
3. Information grades--for example, grading done for the information and guidance of the graded, or for the analysis of educational effectiveness, or for the determination of educational needs.

Although we will begin dealing with these three categories sequentially, it must be emphasized immediately that our inexcusable habit of using the same grades for several different purposes is the root of deep trouble.

Terminal grades, except for honorary embellishments, tend to be dichotomous. A student either succeeds or fails. A student gets a "pass" or "not pass"--i.e., he gets a degree or he doesn't. There is an irony in this, though perhaps only a trivial one. Only at the moment of graduation do we cease to graduate people. A man is either educated or he isn't! Our colleges simply sort the sheep from the goats--and then hand out the sheepskins.

Now it can be laid down as an absolute law that the concept of "efficiency in higher education" has no meaning whatever independent of some notion about the objectives of higher education. What is it we want to do more efficiently, educate people, or separate the sheep from the goats? The ritual of handing out degrees does not educate people; it sorts them--with a vengeance.

Let us set aside for the moment the question of whether the function of our colleges is to educate or to sort. Instead, let us consider this question: If the function of our colleges is to sort people, do they perform this function efficiently?

Inefficiency in sorting can mean two very different things. We can be grossly inefficient by sorting people in the wrong categories. We can get some sheep mixed in with the goats, or vice versa. But we could also be grossly inefficient even if the sorting process eventually put everyone in his right place. For example, we might be able to separate sheep from goats--real sheep from real goats--by roasting them all on a spit and seeing which ones tasted like mutton. We might be able to separate them this way with hardly ever an error--but there may be easier ways to do the sorting! These two types of sorting inefficiencies can be distinguished as inefficiencies in results and inefficiencies in process.

It will be necessary for us to concentrate on inefficiencies in process. To talk usefully about inefficiencies in results would require some knowledge or agreement about: (a) what results are really desired, and (b) what results are actually achieved. We know little about either. Even if it were agreed that the purpose of degrees was sorting rather than educating, there would be no agreement on either the desired or the actual sorting results.

The pretense that college degrees divide the population into the "educated" and the "uneducated," or the sophisticated and the naive, or the wise and the foolish, or the knowledgeable and the uninformed, seems too frivolous to warrant denial. No person grows up in our civilization without being sophisticated about many things, and no one graduates from our colleges without being woefully ignorant about many, many, many things indeed. Any college graduate who presumes to know a lot clearly doesn't. Then, whom are we trying to separate from whom?

Perhaps we are separating the intellectually gifted from the dullards? Or the industrious from the lazy? Or the conforming personality from the non-conforming? Or the well adjusted person from the emotionally disturbed? Or the persevering from the easily discouraged? Or those who attended good primary and secondary schools from those who were less fortunate? Or students from good homes from those who never knew such blessings? Or the rich from the poor? Who knows? Who knows what is really wanted or what is really achieved?

No matter which one of these characteristics, or which combination, is the intended sorting criterion, and no matter which is the actual sorting criterion, the sorting could be done in four days as easily as four years! If we seriously want to improve efficiency in higher education, here is an opportunity to improve it--by a ratio of about 365 to 1. If we are going to look for real possibilities to make dramatic gains in the efficiency of the higher education system, we had better look "where it's at"--that is, we had better look at the sorting process and at terminal grades.

TERMINAL GRADES AND SORTING EFFICIENCY

Could we really increase the efficiency of higher education by a ratio of 365 to 1? Perhaps, if sorting were the sole business of higher education. The answer depends upon many things--particularly upon our choices, or our presumptions, about the objectives of the higher education system. Sorting people is only one of the possible objectives of the system. Furthermore, there might be no real improvement in efficiency with respect to this one objective even if we did reduce the sorting process from four years to four days. That change might reduce costs by a ratio of 365 to 1, but perhaps effectiveness would be reduced too. What then, if anything, can be said about the impact on sorting efficiency that might result.

If the actual (or if the intended, though unadmitted) sorting criteria are such things as wealth, family background, manners, language style, etc., we have no problem. It might take four years to obfuscate such criteria but it surely wouldn't take more than four days to effectively sort people on the basis of such criteria. If these were the criteria, there would be no reduction in effectiveness whatever from a reduction of four years to four days, and the overall improvement in sorting efficiency would remain in the neighborhood of 365 to 1. Little would be lost by the change except a travesty--and perhaps the blessing of the few exceptions allowed in the sorting process to maintain the necessary facade.

But suppose the sorting criteria are such difficult-to-define and difficult-to-measure characteristics as perseverence, "scholarly aptitude," "personal adjustment," mnemonic skills, inquisitiveness, analytic ability, punctuality, self-discipline, attitudes toward authority, or whatever else we think is, or should be, important in distinguishing the college graduate. How then might a four day sorting process, based on numerous and varied testing procedures, compare with the four year process?

Let's consider four different aspects of effectiveness of the two alternative testing-grading-sorting processes: comparability, coverage, interpretability, and accuracy. Perhaps we can get some preliminary notion of how much effectiveness would be lost if we chose the dramatic cost savings that the shorter process would offer.

By "comparability" we refer to the facility and reliability with which one person can be compared with another on the basis of the results of a testing, grading, and sorting process. Would the "comparability" of the four day process be lower than that of the four year process? On the contrary, in this respect at least, the four day process should have a marked advantage. There are far more uncontrolled variables in the longer process and there is much more ambiguity of meaning in the tests, grades, and sortings that characterize the longer process.

By "coverage" we refer to the number of people who can be included in the sorting process. Would fewer people be able to undergo the four day process than the four year process? Obviously, in this respect, also, the four day process has a considerable advantage. Almost anyone could afford to go through the four day process. As a matter of fact, a person could repeat the process every other year of his life at only one tenth of the cost of one excursion through the four year process. If we want to be comprehensive and fair in the distribution of opportunities or if we want to allow people the opportunity to overcome their own, or someone else's, mistakes or limitations, the shorter sorting process could be much more effective than the longer one.

What about the "interpretability" of the results of these alternative processes? With well-constructed, imaginative, varied, testing procedures, we might be able to offer some guesses at the end of four days about how adept a person is at memorizing various things, how diligent he is in pursuing the implications of assumptions, how capable of following directions, how perceptive of the limitations of his knowlege, how imaginative in discovering alternative hypotheses, how inquisitive, how willing to cooperate with authorities or with peers or with subordinates, how independent in view point, etc. The guesses won't be very reliable. Moreover, if the testing procedures are any good at all, we will certainly discover that any man's memory, or diligence, or perceptiveness, or cooperativeness, or persistence, or inquisitiveness or whatever, will vary over a wide range depending upon the nature of the subject at hand

and upon the circumstances. The four days of examination would generate more questiong than answers. No, we won't know very much at the end of four days!

But the question was: Will the results of the four days be more, or less, interpretable than the results of a four year testing and sorting program? Will the results be more, or less, enigmatic? More, or less, relevant to real evaluative needs?

For all the unquestioned difficulties in interpretation that would accompany the four days experience, certainly we could derive many more interesting insights and hunches from that experience than we could by reviewing a college transcript. Of course success or failure in college means something! But who knows what?

One final aspect of the comparison of a four day and a four year testing-grading-sorting process: Which process is more "accurate"? Which of the two processes will make fewer sorting errors? Even if we could give any precise meaning to the concept of "accuracy" with respect to such nebulous estimates or predictions as we are discussing, it would still be almost impossible to determine the degree of accuracy of the two processes. The reason is that either process has too many self-fulfilling characteristics. Tell a man that he is a dullard and he may believe you and act accordingly. Certainly his potential employers are likely to act accordingly. Who knows, with our grading procedures, whether we are predicting the future or determining it?

If by "accuracy" we mean such related things as "consistency" or "replicability" or "objectivity," the four day process would be more accurate. But if we mean "predictive validity," it is likely that either of two processes would have advantage over the other depending upon what specific predictions were being made.

To summarize our comparison of sorting effectiveness, the four day process should be more effective than the four year process in terms of comparability, coverage, interpretability, and it should be at least equally good in terms of accuracy. Even if the two processes were equally costly, there are substantial reasons to prefer the shorter rather than the longer process.

TERMINAL GRADES AND EDUCATING EFFICIENCY

As we have emphasized earlier, the higher education system has many objectives to pursue. Sorting is not the only objective. Some would deny that is was a proper objective of the system at all. Some would claim that the sorting process could be carried out more efficiently by other agencies rather than as one function of the higher education system--and, indeed, this is more or less the implication of the preceding analysis. But what would happen to efficiency in educating, as distinguished from efficiency in sorting, if we abandoned our decision--or our habit, or our compulsion--to issue terminal grades, i.e., degrees?

What function does the terminal grade perform in the educating process? With due respect to valedictorian addresses, graduation ceremonies themselves are simply not very educational. What linkage exists between the ritual ceremony of "graduating" and the preceding efforts toward educating? The answer, of course, is that the degree is the reward, the carrot, necessary to prompt learning efforts. Without the reward, who would bother?

Now it is important that we sort out rather carefully the implications of this answer. First let us note that it matters greatly whether we use the definite or the indefinite article in referring to reward: it matters greatly whether a degree is the reward or a reward. Second, let us note that the degree itself is probably not too rewarding. Granted that the true essence of scholarship and learning is all too often lost in the rituals of our institutionalized education processes, but surely, even so, not many students will see their reward in the scrap of paper or in the title given to them on "graduation day." If they do, their years in college were totally vain and they should never have attended. If any reward at all is found in a degree, surely it is found not in the degree itself but in the opportunities and the special privileges it confers. Either the degree is some sort of union card or admission ticket, or else it is nothing of consequence. If, then, we decide to do our testing-grading-sorting of people through some other processes rather than through the granting and withholding of college degrees, a degree will cease to be an appetizing carrot. Won't a dramatic decline in educating efficiency be the inevitable result?

Who would sit through monotonous lectures, for instance, if the time spent didn't contribute to progress toward a college degree that was essential to one's future? Who would memorize names and dates and definitions, only to be soon forgotten, if there were no payoffs? Who would study courses that they detested, or books that they found boring? Who would register for classes or courses at all, unless they really wanted to learn something? And who would register even then--unless the classes offered the best available way to learn?

It is no surprise that many investigators have found grades to be the most important motivating factor in higher education. Naturally students are going to work hard to overcome whatever hurdles are put in the way of their getting the prized certificate attesting to satisfactory investment of four years of their time and no small amount of money. These investigators have less to say about the relative amounts of learning generated by voluntary effort and by threats of reprisals.

Yes, the impact on educating efficiency would be dramatic. Without degrees, the only learning efforts undertaken are likely to be those that are (a) well motivated and (b) comparatively effective. That would be a revolutionary change indeed!

It would be too revolutionary. We could more easily estimate the consequences of evolutionary changes in the higher education system. More important, we could more easily adapt to the changes. It is a real challenge to estimate the consequences of a change as revolutionary as the elimination of terminal grades. If only the well motivated learning efforts were undertaken, what kind of education would people get, and what kind of scholars would they become? And if only the comparatively effective learning processes were utilized, what would happen to the twenty percent, or thirty percent, or fifty percent of college faculties who would no longer be in demand? The possible consequences confound the imagination.

Perhaps we should abandon the idea because of the threatened reduction in employment opportunities for faculty members. But if we do discard the idea for this reason, we are not seriously interested in improving the efficiency of higher education. Our education system is "labor intensive." The cost of labor (i.e., student time and faculty salaries) constitutes a large part of the cost of the system. If dramatic cost savings are going to be discovered, they are going to be found in the form of reduced student time in college and reduced faculty/student ratios. Students will have to become self-motivated, self-guided, self-critical. Students will have to learn how to read books rather than instructors' minds. But if we abandon all ideas that threaten to reduce years in college or threaten the job security of faculties, we are abandoning the quest for significant improvements in educating efficiency.

It would be better if we abandoned terminal grades. No device could have been contrived more certain to corrupt the educational process--or more certain to neutralize pressures toward improved educational efficiency. So long a "degrees" are necessary for those who want better opportunities and so long as teaching faculties themselves determine how "degrees" must be earned and who will recieve them, no dramatic improvement in either the essential substance or the productive efficiency of higher education is going to occur! Why would it? Why hasn't it occurred already?

DELETION OF TERMINAL GRADES--PRO AND CON

There should be no doubt that the ritual of awarding terminal grades, or degrees, serves a purpose. The practice has its advantages. Few things are invented, and still fewer survive, that do not. Even war, it is said, serves its purposes, and so do overgrown bureaucracies, and ancient rituals, and exclusive fraternities, and disease, and hostility, and tobacco, and manure, and juvenile gangs, and almost anything else one can mention. The relevant question is not: Do terminal grades have advantages? The relevant question is: Do the advantages outweigh the disadvantages?

The principal advantage of the ritual is not likely to be found in its contribution either to the task of sorting or to the task of educating. Rather, it is likely to be found in another task that is closely related to both: the task of certifying. How can the public know what qualifications a man has if we cease to award and withhold degrees?

Certification is an important matter. The public needs to know who is a competent medical doctor and who isn't. It would be great, also, if the public could know who is a competent automobile mechanic and who isn't, and who is a competent politician and who isn't. Certification serves a serious need. But like all good things, certification can show up at the wrong places, at the wrong times, and in the wrong forms. Because we have a real need to certify medical doctors and auto mechanics, it does not follow that we have a real need to certify, for example, aeronautical engineers. Companies that employ such engineers have sufficient means to review a man's record and to predict his potentialities without reading diplomas. But even if we felt compelled to certify engineers and even if we believed that a man's instructors had some truly essential inputs to contribute to the certifying process, it still doesn't follow that his instructors should have the only, or the final, say about certification--whether their say is affirmative or negative. Nor does it follow that there is some one critical dividing line separating those who can contribute to the field of "engineering" from those who cannot. If, instead of engineers, we consider "Bachelors of Arts" in such fields as economics, or astronomy, or philosophy, or physics, or business administration, or English, or whatever, surely the claimed need for certification is no more compelling than with engineers. Nor is the suitability and validity of a college degree as the means of certification any greater.

Certification by completion of a college curriculum is one of the benefits we will have to give up if we abandon the custom of awarding terminal grades. Alternative procedures of certification, where they are really needed, would have to be developed. The alternative procedures could be less reliable, less open to all contenders, more expensive, more restrictive than the college degree procedure. On the other hand, they could be better in all those respects. Our experience with airline pilots and medical doctors, for example, may give us some confidence that a specific certifying process created to meet an undeniable need could be a distinct improvement over the college degree process.

Another loss, if we delete terminal grades, is the compulsion it generates in students to complete all sorts of required courses. Students won't get a well-rounded education, any more than they will get a well balanced diet, if not compelled. Physicists will never discover the beauty of literature, and drama students will never discover the beauty of physics, and neither of them will learn enough political science to be good citizens. Some students will never even discover their true calling, spending their lives as architects rather than astronomers, or philosophers rather than physicians.

There is no denying the frequency with which a student finds, in some required course that he would never otherwise have taken, some new and genuine interests or some extremely useful insights. There is no justification for denying, either, that many students find in such courses little more than an unfortunate reinforcement of negative attitudes towards other fields of interest or, worse, a completely mistaken belief that they understand economics, or existentialism, or scientific method, or history, or international affairs, or social problems, when in fact they have only managed to digest a half-cooked and harmful hodge-podge of misconceptions about them.

There will be some loss when "required courses" no longer have meaning because there are no longer degrees which require them. Employers and certifying agencies may require demonstrated capabilities of various kinds, of course, and this may prompt students to take various courses they might otherwise neglect. Further, if we cease to preoccupy students with requirements, if we cease to make every learning experience a prescribed chore and anxiety-generating trial, a number of students will generate interests and exploratory habits of their own. Given sufficient time, the number might be large rather than small.

The costs of giving up terminal grades are real, but they are not exhorbitant. The gains are to be found in significant improvements in the sorting process along with dramatic reductions in its costs, and in increased efficiency of the educating process, first by emphasizing well-motivated learning efforts and, second, by selecting efficient learning processes. Incentives in the current sorting and educating system are either impotent or actually contrary to the task of promoting efficiency. Faculty members have no incentive toward efficiency, and students have no options. The supporting public has only one option, to withhold funds, and, if they weren't exercising that option, there would be no pressure at all to improve the system. Employers have no reason to do anything but exploit the system at the expense of taxpayers and students alike.

The current system, with its emphasis on degrees, is destined to get worse with the passage of time rather than better. So long as degrees are given, whatever they mean, they will remain consequential in the market for jobs and opportunities. So long as they are consequential, it is only reasonable that everyone be given a decent chance to get one--whether the four year obstacle course is necessary or not, and whether the student actually wants it or not. And, after we manage to get everyone through the course, we will only discover that, since Bachelor's degrees are very commonplace, a Master's degree is really necessary for all but menial job opportunities. It is a costly and futile game. It is a losing game for everyone, except, of course, faculty members. Degrees, like the indulgences disseminated by the medieval church, have outlived their usefulness--if they ever really had any.

OTHER GRADES

Grades are a troublesome and ubiquitous problem--a problem that worries every student save the exceptionally capable and vexes every professor save the exceptionally dull. We discussed terminal grades first because, if they are abandoned, the difficulties associated with other grades will be tremendously reduced. So long as grades determine who does and who doesn't get blessed with a degree and so long as degrees are necessary to enter the promised land, grades will bear too great a burden. Once that exaggerated burden is lifted, grades can play some more modest role with a modicum of success and with much less anguish.

If a student wants to know what some professor thinks of his progress in anthropology, he can ask. (Of course, the student may have learned to read books and, consequently, he may not need a professor in anthropology and he may not have one readily at hand, but surely he could find one somewhere.) If he wants to find out how he is doing in thermodynamics, he can take an examination. If he wants to demonstrate his capability to some one, he can have the examination notarized. If he wants a written evaluation from his instructor in English composition or philosophy, he can ask for one, and he can get an evaluation a lot more meaningful than an "A." He can ask what the instructor thinks of his capability, or his potentiality, or his progress, or his grasp of essentials, his originality, his questioning, his effort, his style, his attitude, his perception, his perseverence, his appearance, his haircut, or whatever it is he wants to know. And he can accept the answers he gets. His future isn't hanging in the balance.

That will be a wonderful change when faculty members are counselors to students rather than their judges, when their task is teaching rather than sorting, when their responsibility is guiding and encouraging rather than directing. We have confounded the role of teachers by giving them more authority and more responsibility than they should want. We wouldn't combine judge, jury, defense counsel, prosecuting attorney, key witness, warden, and parole officer all in one person, yet we have tried to do something like this in the field of education. When grades cease to be linked directly to degrees, which are then linked directly to opportunities, grades will become helpful evaluations and teachers become teachers. (They will have to become teachers, and good ones, or no one will need them.)

ADMISSION AND CONTINUATION GRADES

So long as we promote an educational style heavily dependent upon teaching faculties rather than on libraries and so long as capable faculties are in short supply, we will probably need to ration educational opportunities. The question about how these opportunities should be rationed is one of the most serious and unsettled questions currently facing the American public. In the past, the wealth of a student's family has been one of the rationing instruments, and it still is, but there are mounting efforts to displace this form of rationing. Quality of students is an alternative basis for rationing but it has two serious impediments. First, quality is difficult to define and difficult to measure. What kind of qualities do we want in a student? Second, quality is often only a proxy for wealth. Wealth provides good primary and secondary schools, and good libraries, and good tutors, and self-confidence, and freedom from the need to earn room and board and tuition. Need, rather than wealth or quality, could be the basis for rationing, but this possibility does not appear to have significant support. Perhaps enthusiasm should be the basis for rationing--let students learn who are most eager to learn.

Currently grades, whatever they mean, are an important determinant of who gets admitted to our colleges and who is permitted to continue towards graduation. Is there any escape from this necessity? No complete escape, perhaps, but a considerable easing of the excessing burden on the grading process. First of all, competition for a seat in the classroom and for space in the dormitory will be much reduced by the changes already described. Institutionalized education will have become "free" in an important new sense--people will be "free" to reject its blessings without being unfairly penalized in the job market for the rest of their lives. And those who elect to attend an institution will be able to "drop out" after one or two or three years without upsetting their parents, their counselors, the U.S. Office of Education, the National Science Foundation, the Ford Foundation, the Governor's Commission on the College Drop-out Problem, etc. No longer will it appear essential to repress every mature impulse on the part of young people to participate productively in their world until after they have spent forty days in the wilderness or four years on a campus. The rationing problem will be much easier because the only demands upon college faculties will be highly motivated educational interests that cannot be more efficiently served in a library, or at a computer console, or on the job. Artificially induced demands and excessive dependencies upon faculties will both diminish.

In the unlikely event, however, that there still remains an excess demand for the privilege of sitting in classrooms and taking lecture notes, we need not depend upon course grades exclusively, or even largely, to ration the available seats. If we want to ration opportunities on the basis of developed capabilities, we can supplement course grades with a very wide variety of standardized tests. If, on the other hand, we want to ration opportunities on the basis of eagerness, we can require all students to spend a number of hours per week, or months per year, or years, in service to their community or their country or their college. We do not need to depend upon course grades.

INFORMATION GRADES

Eventually grades may have as their primary purpose the production of information for the guidance of the graded, for the analysis of educational effectiveness, and for the determination of educational needs. The generation of such grades should be encouraged and, wherever possible, facilitated by the development of a wide variety of objective testing and measuring instruments.

One particular type of grading has been long neglected---evaluation of faculties. It is often alleged by faculty members that objections to grading are misguided--people are continuously graded in the real workaday world, they say, and they might as well get used to it. There is much truth in this assertion, and faculty members should surely be graded. Before students commit several months of precious time to studies under a certain instructor they should have some estimate of his capabilities, his strengths, his weaknesses. Before a student enrolls in a certain department or program, before he chooses a school to attend, he should have as much data as he can get about them from past records and evaluations. The cause of efficiency in higher education would surely be advanced if more systematic efforts were undertaken to develop grades that could be available to students to guide their choices.

CHAPTER 17

CURRICULUM CHANGE

INTRODUCTION

Investigating curriculum, which Tom Venable describes as the starting point and end product of all we do in education,[1] is no easy task. The literature search alone is staggering. In the five years since 1965, more than 200 books, not to mention articles, have been published on the subject. Some had to be scanned. The others read thoroughly. Moreover, through various agencies, ERIC for example, hundreds of current reports on Curriulum and Curricular Change were located and scanned.

In addition, academic reports, such as the Muscatine Report at Berkeley, the Doty Report at Harvard, the Magaziner Report at Brown, and the Coffe Report at British Columbia, were reviewed.

Observations of campuses throughout the U.S. and Canada and interviews with their administrators, faculties, students and staffs were undertaken. Visits to nearby "establishments" such as restaurants, music halls, bookstores and taverns were also made in order to gain additional contacts and information.

Apart from the sheer magnitude of the jobs of locating and reading materials involved in curriculum change and observing and interviewing in order to develop insights into the problems, the investigation's results were discouraging. The search was for "curricular change." There was much of that. But a growing awareness, brought on by learning what was going on, prompted us to have misgivings about change, about reform, and about viability of the entire structure of higher education as it attempts to serve social needs. Perhaps the pages that follow reflect those misgivings to a degree that is out of proportion. Hopefully, they do not.

CURRICULAR CHANGE

Two recent studies sum up rather concisely the actual curricular changes which have occurred over the past decade or so in higher education. These studies are Undergraduate Curriculum Trends by Paul Dressel and Frances DeLisle and Innovation in Liberal Arts Colleges by Michael Brick and Earl McGrath.

The Dressel-DeLisle study concerned itself with curricular changes for the period 1957-1967. It analyzed course offerings from a random selection of 322 "representative" institutions. Regarding general education, the report made the following summary statements:

1. Formal requirements in English composition, literature and speech have decreased.
2. Foreign language requirements have increased, with two years (or the equivalent) being by far the most common requirement.
3. The use of proficiency tests for meeting requirements in writing, speech, and foreign language has increased.
4. Requirements in philosophy and religion have been reduced with these subjects more frequently appearing as options in a distribution requirement.
5. The specification of mathematics as a requirement or an option has increased.
6. There is some tendency to reduce physical education requirements and to eliminate credits and grades for it.
7. Basic and general requirements remain and are roughly divided into 17 percent humanities and 10 percent for each of the social and natural sciences.[2]

All data for this study were gleaned from college catalogs. In the concluding chapter of the report, the authors commented that, despite much talk about innovation, the total activity directed toward curricular change during the period they studied could be described at best as minimal. Courses and academic requirements were often altered to suit organizational changes and to include new disciplines, but there seemed to be no concern for making curricula more flexible.[3]

Reasons listed in catalogs to explain curricular changes were focused by Dressel and DeLisle into six somewhat specific rationales.

1. Increasing numbers of students means better and more varied backgrounds and preparation, a wider range of talents, and more diversified interests.

2. Students should be encouraged toward mastery of tool subjects prior to college to be applied toward admission and possibly, in some cases, to the fulfillment of undergraduate requirements.

3. Acknowledgement of individual differences calls for varied responses and the provision of learning experiences sufficiently challenging to all. Attempts are made to provide differential requirements, special sections of regular courses, and individualizing experiences to the extent students can make use of them.

4. Basic and general requirements reflect an emphasis on breadth, mentioned by 80 percent of the institutions as essential for the early college experience. The usual definition consisted of contact with the major areas of knowledge. About 20 percent require a more extended interpretation to include some variety of off-campus experience for all students.

5. An additional source of learning is represented by the increasing necessity for the student to accept responsibility for the development of his own educational plans. Decisions about options and choices relevant to present and future plans should lead to increased awareness and serve as a central source of insight.

6. The value of the integrative experience from the beginning college years is acknowledged by those institutions providing interdisciplinary courses, seminars, and independent study as individualized means of fulfilling curriculum requirements.[4]

Brick and McGrath were concerned with "innovative" curricular changes rather than just curricular changes. In their chapter entitled "New Approaches to Curriculum," they point up eight major innovative curriculum practices, citing some of the schools which have incorporated these practices, and mentioning reactions to the innovations.[5]

Interdisciplinary Studies. These appear in the form of interdepartmental majors (San Francisco State; Springfield College, Massachusetts; Michigan State); combination courses "which seek to establish base structures for fields" (University of Santa Clara; College of Arts and Sciences, Wisconsin State University); integrating courses or seminars "to help students bring together the various strands of their collegiate experience" (University of Chicago; Andrews University, Michigan; Humboldt State College, California); humanities (Cornell College, Iowa; College of Saint Benedict, Minnesota; College of Arts and Sciences, Florida State University; Lincoln University, Pennsylvania; Oberlin, Case Western and Findlay, Ohio; Michigan State); non-Western studies (Central Michigan University; Mills College, California; Simpson College, Iowa; Michigan State; Ohio University; University of Nebraska; Bowling Green State University); urban studies (New York University; Springfield College, Massachusetts; Union College, New York; Amherst College, Massachusetts, Hope College, Michigan).[6]

Generally, Interdisciplinary Studies have been criticized because they "were very expensive to maintain because of heavy commitment of faculty time to the enterprise and the relatively low election rate by students (Sloan Committee of Hope College, Michigan); "administrative arrangements for interdisciplinary programs in social science and the humanities provided little more than an academic 'half-life' for faculty members with a committment to interdisciplinary instruction;" "moreover, present arrangements were so cumbersome as to place an excessive burden of conference, argument, and negotiation on faculty members" (College of Liberal Arts of the University of Minnesota, Ad Hoc Committee Report); "it is very difficult to obtain faculty members who can make the type of integration of American History and American Literature required" and "it has also usually been difficult to obtain superior students...." "The 'withdrawn specialist' is most unhappy working in this context and fights the system rather than supporting it."[17]

On the other hand, Interdisciplinary Programs have been much praised: "various departments become aware of each other's disciplines" (President, Albright College, Pennsylvania); "...courses are generally popular with students and enjoyed by participating faculty" (Sister Marion de Rioci, Dean of Studies, Rosary College, Illinois); they provide a "cross fertilization of the disciplines;" "such studies...(expose)... the artificialty of the lines between the disciplines...(and)...seem to create more interest than the ordinary courses;" "the problems of urban living are almost always...'inter-disciplinary'."[8]

Honors Programs. Despite their highly "elite" demands, honors programs can serve the needs of the "intellectually gifted" scholars of the student cadre without impinging upon the academic rights of those who do not meet the requirements. Generally, honors programs "stress important questions and raise value issues" and clearly seek to place work in a broad context and to help students establish relationships between their lives and what they study."[9]

Some schools have extensive Honors Programs. As listed by Brick and McGrath: Western Washington State College (on a one-to-one tutorial basis for all class levels with colloquia and an honors thesis); University of Vermont (upper division only with a written and oral examination); Morris Harvey College, West Virginia, (all class levels with upper division public colloquia); Bellarmine College, Kentucky, (limited to 20 students per year who are excitable to "heightened intellectual effort"); University of North Carolina; Macalester College, Minnesota; Albion College, Michigan; Cornell College, Iowa; High Point College, North Carolina; College of Liberal Arts, Syracuse University.[10]

Freshman Seminar Programs. In addition to Harvard and Stanford, many liberal arts colleges have Freshman Seminar programs; Antioch College, Ohio; Lawrence University, Wisconsin; Lindenwood College, Missouri ("part of the core approach"); Adrian College, Michigan, ("part of their honors program"); Westmont College, California; Guilford College, North Carolina, (much like an honors program)."

Independent Study. Brick and McGrath ennumerate three advantages of independent study (as ascertained by their respondents):

1. Students are encouraged to work independently and individual resourcefulness and self-discipline are fostered by the use of this approach.
2. There is a closer interaction between faculty and students.
3. Student-centered teaching is effective in improving problem solving and the ability to apply concepts to fresh situations and in promoting noncognitive changes.[12]

Complaints: "some students. . .had to work too hard on their independent study projects; many undisciplined students take on more than they can handle; approach cannot work successfully unless the instructor provides some preliminary structure."[13]

Non-Western Studies. Five "approaches" are identified:

> (1) extracurricular fascination with the world overseas; (2) course work in international relations or world affairs; (3) general courses in introduction to a civilization; (4) infusion of non-Western material into regular disciplinary courses; (5) area studies as a formally recognized part of the curriculum."[14]

Undergraduate Study Abroad. For the most part, study abroad, although experientially rewarding, is a cultural digression in the student's college career. The number of such programs offered has increased from 6 in 1950 to 598 in 1968, according to Brick and McGrath.[15]

Work-Study Programs. "An increasing number of colleges are requiring work experience as a regular part of the student's college program." The programs vary. Some have "time off-campus" requirements (Beloit College, Wisconsin); others have plans which integrate "classroom instruction and work experience," "particularly for the disadvantaged," involving "cooperative job assignments. . . carefully planned and supervised to produce optimum educational results for each student" (Golden Gate College, California).

Work-study programs are, in fact, seen mainly as a means for assisting disadvantaged youth to "attend college" and "concurrently gain creative work experience." Expanding the concept of the program might be a superb corollary to Urban Studies in Community Colleges when job-training programs are firmly established, especially in California.

Community Service Projects. Antioch College, Ohio, has long been the recognized "pioneer" in establishing "community service projects as a major resource for student learning." Other colleges with well-established programs are: Earlham College, Indiana (Program of Community Dynamics); Brooklyn College (requiring that "all education majors are given two semesters of voluntary service in community agencies;" Berea College, Kentucky.

Newer programs have been established at Webster College, Missouri, (Mullanphy House); College of Arts and Sciences of Washington University, Missouri (Education in Action program and one "run by the campus 'Y'"); Allegheny College, Pennsylvania (Allegheny Community Exchange), Adrian and Sienna Heights Colleges in Michigan (joint program using public and parochial schools as laboratories); Phillips University, Oklahoma, West Georgia College (Studycades).[16]

Besides illuminating the study of curriculum, both the Dressel-DeLisle and Brick-McGrath studies provide starting points for a definition of terms. "Change," "innovation," "reform" are words often used interchangeably. For the purposes of this discussion, change, in the general sense, will include innovation; in the particular sense, it will mean simply a revision of course structure or course requirements. Innovation will mean a change that not only has not been long in current practice but, as well, expands the concept of curriculum to include other disciplines or, heretofore , external disciplines such as Community Service. Both "change" and "innovation" operate as emanations from the university often reaching into the community.

Reform, on the other hand, may begin as curricular change or curricular innovation but in intent and potential has broader implications. Reform will refer to a curricular concept which is designed to instigate sweeping social change.

From the Brick-McGrath list of major innovative curriculum practices, two (if made the primary curricular trust of an institution) might be considered "reforms" instead of simple "innovations." These two are "Work-Study Programs" and "Community Service Projects." The potentials for these kinds of programs are exemplified in another section of this report entitled "Urban University." As far as universal higher education is concerned, Community Service Projects could become the most important single involvement of the multiversity of the future.

J. B. Hefferlin, in another study involving 110 institutions, observed that one out of every five courses offered in 1962 had been reorganized or substituted for by 1967. Hefferlin generalized that the dominant trend in "course expansion and reform" was toward analysis of disciplinary problems "for their own sake and for the sake of knowledge itself."[17] Regarding the institutions themselves, Riesman's isomorphism, "whereby" all institutions come to resemble one another,"[18] is descriptive of the on-going process. Hefferlin points out, also, that the most frequently cited reason for curricular change is the desire to provide more opportunity.

The changes studied by Hefferlin, Dressel-DeLisle, and even Brick-McGrath, seem to be the slow, inevitable type influenced mainly by slight changes in the social awareness level of faculty, students and friends of the university. The relevance of these changes to education itself is dubious; their relevance to the external world, gravely questionable.

The University has failed to keep up with times, it appears. Therefore, its importance as a social institution, that is, as an institution which bears more than a physical relationship to the world around it but rather operates relative to that world and in collaboration with that world, must not be taken for granted.
In a multi-sponsored study, Lewis Mayhew reports that "The real enigma is the future of undergraduate education. Clearly there is unrest; clearly there is questioning of purposes and goals, and clearly there are significant experiments with new sorts of programs--but no (constructive) pattern seems to be emerging....The only responsible prediction...must be that undergraduate education will experience less change than other sectors (by 1980)."[19]

All these reports seem to indicate that the failing of the American university - which became clearly visible for the first time in the late 1950's, about the same time student unrest was mounting - is still in progress. Undergraduate curriculum, naturally, bears the thrust of this failing. There are several reasons for this:

1. The tardiness of the university to respond to feelers for change (reports, studies, social and psychological trends among youth) is reflected ultimately in that section of curriculum which involves the greatest number of students and where change would involve the most "effort" by the university: general and core education.
2. The inability of a professional faculty to become wholeheartedly involved in the education of transient novices who are not, for the most part, in pursuit of (the faculty's) narrow and highly specialized areas of knowledge.
3. The failure of the administration of the university to take seriously the importance of undergraduate education or to implement, except in token concessions, plans for sweeping curricular reform.

Despite the apparent failure of the university itself to bring about the change that is needed - the restructuring, the curricular reform - other attempts are being made. Innovation, for instance, has been shown to be possible to the extent that the university will permit. The problem with innovation centers around the bureaucratic system upon which the university functions. Thus, the smaller the scope of an innovative change, the greater its chances of receiving approval and, ultimately, of being successful. Dr. Brown's advice on building a university-wide curriculum might very well apply to innovations: "move from the fundamental core of knowledge in each major discipline only so far as it is educationally necessary to do so."[20] Of course, his remarks are not specifically intended as this kind of advice, although much innovation proceeded along just such lines only to find, after acceptance, that it had been, in fact, assimilated. Interdisciplinary programs are a good example, especially Social Ecology and Comparative Culture studies. At a major California campus, for instance, the Social Ecology program and the older Comparative Culture program seem to have become subdisciplinary rather than interdisciplinary. Social Ecology finds itself concerned with a small and rather obscure area of social studies even though its limited professorships are borrowed from several faculties; and Comparative Culture finds itself contentedly limited to the investigation of racial minorities.

Dr. Brown insists that building begin from "the core of knowledge in each major discipline" at the urging of "each department" according to what it "believes to be" the best body of knowledge to be used as a means of education." His remarks imply that the university is a functioning organism already and that "building" is really "changing." Change, to be innovative, must begin outside the "core of knowledge," perhaps outside the parochial confines of the university itself if that would not forego the autonomy of the structure. Brown emphasizes: "The goal of curricular policy is, in sum, to assure that educational decisions...persistently, remain a reflection of the needs of the student."[21] That faculty alone can assess those needs is a dubious assumption.

Mayhew, in a monograph for SREB,[22] cites twelve "experiences" derived from demands and criticisms of undergraduates which, he thinks, should be considered important enough to be built into proposed curricula:

1. Every student should have the opportunity to engage in independent study in which he sets his own goals, proceeds at his own rate, decides when he has finished, and feels free to use or not use professorial resources the institution provides. This independent work should not be confused with a scheduled tutorial arrangement, where the volition seems to rest with the professor. Rather, it should be the opportunity for students to succeed or fail on their own.

2. Every student should learn in large impersonal situations. As adults, much learning goes on either through mass media or in large group lectures and the like; and college students should probably be able to do this without feeling threatened or particularly lonely. Thus at least one large lecture course might be expected to be part of the experience of every student, with no discussion groups, laboratory groups, or further assistance provided.

3. But students also need to learn to function in small groups, and do need the encouragement which a small group developing a high esprit de corps can provide. Thus the curriculum should be structured so that in some way every student has a sustained experience in a small group, and the time should be long enough so that the groups could take on many of the characteristics of a primary group.

4. Every student should have a relationship with an adult professional person which is sustained over a long enough period of time so that the adult can serve as an appropriate role model, parent surrogate, and friend with whom the student can test his emerging notions of reality. This relationship is probably the most important single experience students require.

5. Every student should have a sustained off-campus experience of some sort. Whether this be cooperative work-study, an overseas experience, or the opportunity simply to study on one's own in a distant city is less important than that the student is encouraged to look beyond the campus walls.

6. Every student should have the opportunity to know intimately a culture or subculture different from his own. This may come from studying in a foreign university, from doing cadet teaching in a culture substantially different from the student's own subculture or from serving as a participant-observer, infiltrating a subculture distinctly different.

7. Every student should be required to make a sustained effort over a prolonged period of time on some task. There should be some courses, possibly quite a few, extending over a full year or more, with final assessment left until the very end. The traits to be developed here are not unlike those generated by work on a doctoral thesis.

8. Every student should have opportunities to engage in a number of brief ad hoc activities, which should have the same curricular value as longer, more sustained efforts. Students should be encouraged to experiment and explore, but should not be expected to make major time commitments to such activities. It is conceivable that a number of explorations might consume no more than a week or two of time.

9. Every student should enjoy, unpenalized, opportunities to engage in play for his personal satisfactions.

10. Every student should have opportunities to gain deeper understanding of his own emotions and those of others. Sensitivity training, group therapy, individual counseling, or similar activities can lead to understanding.

11. Every student should have a chance to learn by using some of the newer media. Society is reaching the point where every college student should learn something with the aid of a computer and with a programmed course using audio and visual aids, direct observation, and reading. The newer media are so important that college graduates might be considered illiterate if they have not learned to use them.

12. Every student should have an aesthetically creative experience regardless of the level of his performance. This suggests some form of required studio work just for the satisfaction of creating something with wood or sound.[22]

The "experiences" seem to emanate from the very history of the university itself, that is, the traditional, the liberal and the radical approaches to university education current today. For the most part, these "experiences" are decidedly "important enough." However, strong issue must be taken with experiences" 2 and 4.

Living itself is frought with impersonality and loneliness. Except for overprotected individuals, it is certainly reasonable to assume that most children, by the age of ten or so, with even rudimentary verbal skills, could articulate what it means to be lonely or what it means to be an indistinguishable part of some mass, not entirely human itself. In young adults, these phenomena are already part of a network of established criteria which has shaped behavior patterns. For most individuals, reinforcement of the phenomena at the college level would seem to be of little value.

"Role model,"and "parent surrogate" are terms which conjure up a plethora of "bad" notions about the nature and purpose of the university. Students need guidance in many areas but it is the diversity rather than the similarity of advise that will truly educate them. It is deplorable enough that the administration has presumed to be "parent surrogate;" let's not have faculty at it too - at least not as part of institutional planning. It is one thing to communicate in a deeply personal way with a faculty member or an instructor; it is another thing to become the lamb in a pseudo-paternal scheme. If one of these types of relationships must be emphasized as a matter of policy, hopefully, it will be the former.

On-going, innovative changes at the undergraduate level have been tabulated by Joseph Axelrod according to major trents. Axelrod's table is reproduced here:

MAJOR TRENDS IN INNOVATIVE UNDERGRADUATE PROGRAMS[23]

Weaknesses of Standard Undergraduate Programs	Innovative Program Responses
Depersonalization in relations between faculty member and student, and between student and student.	Creation of relatively small "primary groups" consisting of faculty and students who, by participating together in the learning process, come to know, care about, and develop a sense of responsibility for one another.
A program of fragmented and departmentalized courses which often relate to other courses within the same department but not to *each other*.	A program of courses organized in such a way that their materials flow into one another.
A curriculum that is isolated from the community and the world, with "credit"-yielding experiences revolving mainly around books, lectures, written papers, and artificial laboratory exercises.	Classroom, library, laboratory work blended together with direct experience in the community and the world as part and parcel of the curricular structure.
Outdated and inaccurate notions about how human beings "learn:" teaching is mainly telling; learning is mainly receiving; the student is mainly an information-skills storage and retrieval unit.	Teaching and learning seen as a process of cooperative inquiry; a "dialectic" as opposed to a "didactic" approach.
Prevalence of notions of academic "success" which give the highest grades to the best gamesman; emphasis on faculty member as "judge" at the expense of his function as teacher and critic.	Liberation from the value system which creates the "grade game" between student and faculty; emphasis on faculty member as teacher and critic, with role of "judge" relegated to some other person or agency.
A pattern of student freedoms and controls--authority and status--that works against growth in students toward independence of mind, creativity, and responsibility.	A pattern of student freedoms and controls--authority and status--that reinforces the values professed by American colleges.

Axelrod's "Responses" attempt to embody resolutions of the three general faults of curriculum which are most criticized by students as well as educators: its irrelevance, its hypocrisy and its dehumanizing effect. Why these responses do not, in theory, or could not, in practice, resolve these faults, and just what these faults mean, are discussed later in this chapter.

SOME PRINCIPLES OF CHANGE

Joseph Tussman, head of the Experimental Program at Berkeley in 1965, restated the purpose of the American College:

> The American college must rediscover and renew its commitment to its fundamental purpose. It has a purpose, and that purpose is, for the sake of all of us, for society and for the individual, to develop our rational powers, to heighten sensitivity to and awareness of fundamental human problems, to cultivate and strengthen the habits and dispositions which make it possible for humanity to displace the varieties of warfare with the institutions, the practices, and the spirit of reasoning together. The college is not the blind or servile tool of transient arrangements, but it is not neutral as between civilization and chaos. It stands with Apollo, not with Dionysius."[24]

The "Muscatine Report" in 1966 stressed "the need for an atmosphere of continuing experiment and change."[25] It tendered four ideas to combat "a natural drift of conventional course offerings toward a specialized and fragmented greyness." These were:

1. Special programs stressing the acitivity of learning.
2. New introductory, breadth and non-departmental courses.
3. Interdisciplinary and University courses.
4. Integration of curricula.

The Select Committee made the following recommendations, among others, to implement these ideas:

Recommendation 22: The administration should arrange for Ad Hoc Courses, the topics of which may be determined from term to term by the Board of Educational Development, to supply the relevant scholarly and intellectual background to subjects of active student concern.

Recommendation 23: The Division should establish a new category of interdisciplinary University Courses, each subject to the regular review of the Committee on Courses. The Division should also develop appropriate means of special administrative support for such courses, where such means do not already exist.

Recommendation 24: An experimental campus-wide program of freshman seminars should be offered, beginning in the Fall quarter, 1966.

Recommendation 25: In order to enable all qualified students to present a limited amount of supervised field study for academic credit; (a) schools, colleges, and departments should be given wider latitude in accrediting field study; (b) the faculty should appoint a body to be responsible for interdisciplinary field study; and (c) the campus should be provided with a field study administrative staff.

Recommendation 26: The University should create a small number of new Professorships of the University, devoted to study of the general human significance of the results of scholarship.

Recommendation 27: The professional colleges and schools should, where appropriate, formulate with the College of Letters and Science optional programs leading to a combined B.A. degree and B.S. degree in not more than five years residence.

These recommendations were made on the presumptions that:

1. Every undergraduate should be offered the option of close faculty contact at any and all levels of instruction.

2. Seminars are not the only alternative to the essentially passive experience of a lecture course; and they may fail to meet the demands of the exceptionally gifted or idiosyncratically talented student.

3. There is a particular need for continuing experiment and flexibility in the area of introductory and breadth courses to accomodate the increasing numbers of students who graduate from high schools with advanced standing. Care is needed to avoid the dangers of planning separately for the gifted and the general student.

> 4. Professors should be able to supply the relevant scholarly and intellectual background to matters which had aroused the immediate interest of significant elements of the student body.[26]
>
> 5. Many of today's most challenging social problems (e.g., poverty, population growth, pollution)...require an informed and technologically more sophisticated citizenry to initiate and support intelligent decision making.[27]

The vitues of the recommendations and presumptions of the Muscatine report are eclectic, idealistic and practical. At first glance, one would imagine that their inculcation into the university scene would precipitate all sorts of desired results. That they do so, in fact, or not, is not relevant to a consideration of their major fault: in substance and in philosophy, they fail to emphasize community - that is, social involvement. As Axelrod puts it, "but the Muscative Report...is unwilling to go further than the recommendation that 'qualified students ...be permitted to present, for academic credit, a *limited* amount of *supervised* field study of demonstrable intellectual value.' The result of such restriction, inevitably, is that community projects have remained part of the extra-curriculum in the standard educational model." (Axelrod's italics).[28]

The significance of this major shortcoming of the Muscatine report becomes even greater when examined in the light of Mayhew's predictions:

> The future of American higher education cannot escape its setting. Barring major war or severe economic recession, the outlines of American society for 1980 are resonably clear. There will be upwards of 230 million people, half of whom will be under 26 years old. More than 22 million will be over 65. Some 80-85 percent will live in urban areas, and a third will live in ten super cities like the continuous metropolitan belts from Boston to Washington, from Gary, Indiana well into Wisconsin, or from Mobile past New Orleans. Half of those living in the cities will dwell in complex suburban areas, while the other half, including a disproportionate

> number of non-whites, will occupy the central city. The work week will average 30 hours or less and the average income after taxes will be $8,724 compared with the $6,285 in 1962.
>
> The broad educational context is also relevant. In 1975, children in kindergarten through grade eight will number 31.5 million, 7.6 million more than in 1965. There will be 15 million high school students in 1975; 8.2 million more than in 1955. Fall enrollments in college degree work will rise from 1955's total of 2.7 million to nine million in 1975 and perhaps 12 million in 1980. Graduate enrollment, which has become the fastest growing segment of higher education, will reach 1.1 million by 1975 and perhaps 2 million by 1980 (a number just over the total collegiate population in the mid 1950's). The great majority, perhaps 80-85 percent, will attend institutions enrolling more than 20,000 students. Expenditures for higher education will nearly double; from the $11.4 billion of 1965-66 to $22.5 billion in 1975-76. Capital outlay during the period 1966-67 to 1976 will be more than $30 billion - compared with the entire gross national product of $56 billion in 1933.[29]

Unless there is a rapid and cowardly retreat by academia to the countryside, the university will be fighting for survival in the depths of an overgrown metropolis; it will be involved coercively and necessarily, if not willingly, in the affairs of the community; it will be looked to - if it does not crumble in the interim - for responsible insight into urban and social affairs; it will be embedded in the problems of society; it should be prepared to study those problems to seek their solutions.

Nevertheless, one result of the Muscatine Report was the emergence of the Board of Educational Development as a potential agency for curricular reform. The Board was virtually free to act as it saw fit. There were few restraints on the kind of suggestions it would listen to; it approved most of them. Unfortunately, political pressure precipitated the demise of the Board of Educational Development.

In the "Report to the University," the Steering Committee for the Study of Education at Stanford listed "the kinds of needs we see, which will have to be determined by the agencies of change that we recommend elsewhere.

1. Science and Technology for the non-specialist...
2. Interdisciplinary studies in the social sciences...
3. Interdisciplinary studies in the humanities...
4. Professional school courses...
5. Mathematics, strategies, and computer science...
6. The practicing arts..."[30]

Several of the recommendations of the Steering Committee seem especially pertinent. Recommendation 1C, for instance, provides for a Freshman Tutorial Program:

> c. For as many students as possible, a first-semester Freshman Tutorial taught by a regular faculty member and directed either toward conveying the style of intellectual inquiry in his field of knowledge or toward illuminating the relationships between his and other fields of knowledge, or toward both.[31]

At Chabot College, Hayward, California, a Freshman Tutorial Program, designed by Professors Fitzgerald and Monker of that school, has been highly successful. Among its benefits: (1) personal contact with an academic seems to speed up rather than slow down the maturation rate of high school graduates as they adapt to the college scene (2) firm establishment, early in the college career of an intellectual basis for learning appears to lend itself to greater involvement in studies in the following years.

Recommendations 15 and 16, stipulate ineraction with community:

> 15. There should be established a social service clearing house, to serve as an information and coordination center for field work that stresses social service. It should work with students, faculty, and off-campus agencies in helping to arrange for various kinds of field experience...
>
> 16. Each appropriate department should establish a regular course entitled Directed Field Research, somewhat akin to Directed Individual Research, which would be listed in Courses and Degrees. The Dean and Committee of Undergraduate Studies should be given responsibility for encouraging and coordinating all field work conducted as part of the academic curriculum.[32]

For the most part, however, the Committee has merely intensified its commitment to undergraduate education in the "liberal" sense There are no sweeping recommendations here although "15" and "16' above could become real reform measures if implemented without restriction.

Although Daniel Bell's study dealt with Columbia University specifically and had no interest in being applied to other schools, ("It is an essay on a single institution, Columbia University, and its problems"),[33] the report, published as a book, relates to the spectrum of American Higher Education at least in as many ways as Columbia is similar to other institutions.

Bell called for a "Neo-classical" three-tiered curriculum rvision. Basically the tiers would move a student from Classical sudies through major studies (fields of concentration) to inter-disciplnary and problem area studies, all with a slight inclination toward Wstern traditions. The report opposed certain current trends; particulrly it objected to "the contemporary cafeteria style of education wich permits students wide lattitude in choosing courses."[34] As Belhimself puts it, "to allow students to plunge around blindly is not freeom. The student must be forced into certain confrontation."[35]

The exact nature of the "confrontation" is, of course, readily debatable. Professor Bell leans toward the liberal arts approach; it has been conjectured that at the time of the study, Columbia, too, was affirming liberal arts (and specialization as well). Important to more recent problems (and probably in keeping with what Bell envisioned as "certain confrontation") are the tracks which he suggests for the study of Western history, one of which a student would choose: "economic, political and social..."[36]

It is into these major areas that urban problems, so relevant to universities of today and tomorrow, fall and will continue to fall.

The Doty Report of Harvard (1964) summarized its own recommendations for curricular change: "We have proposed a wider offering of General Education courses and a greater range of meaningful alternatives for the student to choose from."[37] Professor Doty and his colleagues on the Special Committee were concerned with the deterioration of General Education at Harvard (and elsewhere). At the divisional level, the Doty Report proposed, instead of the three-way humanities, sciences, social science categories, that for the purposes of general education the areas of relevant learning be simply divided between the humanities, which in our usage will include history and the full range of subjects traditionally grouped under the humanities, and the sciences, which will embrace natural science, mathematics, and the behavioral sciences. This division is not advanced as the basis of a theory of knowledge; it is simply a device for effecting a program of non-departmental education within the constraints of the problem as we understand it.

The rationale for this new division is vague but, in effect, it would have reduced the General Education requirements at Harvard by two-thirds.

The Committee on Educational Policy (CEP) a year later suggested that a student could "skip" General Education courses altogether in certain cases or substitute for them.

The Doty and the CEP reports seemed to have been paving the way for "departmental" dominance of General Education which now appears to be falling into disfavor.

The most important aspect of both reports is their implicit admissions that students coming to college are, indeed, "generally educated" and should not be delayed from going on to more intriguing and more relevant studies.

In general, the reports discussed have not brought about significant changes in Higher Education. The Doty Report was overwhelmingly defeated at Harvard. And although most of the proposals of the Muscatine Report were approved by the Senate of the Berkeley Division, it, too, has quite recently been rejected.

To stress further the singular importance of curriculum in the university structure should not be needed. But to find guiding principles for curricular reform in the tradition of haphazardry which has delineated curricular change over the past three decades, one needs to remind himself over and over that such reform is central to a restructuring of the university, if restructuring is indeed what's needed. The question is: Is reform possible? Experience, so far, indicates that it may not be.

INKLINGS OF REFORM AND THEIR FAILURE

The Board of Educational Development. The most creative innovation resulting from recommendations of the Muscatine Report was the Board of Educational Development. As stated already, this Board seemed to have great potential for bringing about curricular reform. (Whether it ever did so or not is, as yet, an unanswered question.) Unfortunately, the Board apparently overstepped its bounds in 1969.

The Board had approved the new course offering, Social Analysis 139X. The course format called for several lectures by Black Panther Leader, Eldridge Cleaver. With great haste the Regents of the University of California gathered together and, under the personal direction of the State's Governor and Chairman of the Regents, Ronald Reagan, overruled the BED and declared that no one could lecture or lead a discussion more frequently than once a quarter unless he held an formal appointment to the University.[38] Cleaver, of course, did not have an appointment. Thereafter, the Board became totally ineffectual and, quite contrary to its previous record, approved only five of twenty innovative course suggestions which were presented to it.

HUMANIST AND EDUCATIONAL NEEDS OF THE ACADEMIC COMMUNITY (HENAC)

HENAC was a highly imaginative and humanistic student-administered program sponsored by the Community for Awareness and Social Education (C. A. S. E.). It was developed under the aegis of UCLA as an alternative to the present undergraduate education; the idea was to allow students to create their own curricula and offer them the opportunity of structuring their own learning situations.

HENAC used UCLA faculty and staff. Although anyone could enroll in HENAC courses, UCLA students received University credit for courses taken (up to 12 units) and in many instances, could use HENAC course credits to fulfill degree requirements.

The program began classroom operation in the Fall of 1969 with four FTE's and 250 students. Student enrollment was expected to double by January, 1970. Some of the features of the program were:

1. Non-optional PASS/FAIL grading.
2. Study groups. There were no professors, per se. Each group consisted of ten participants, including a PROCESS OBSERVER and an INITIATOR. The PROCESS-OBSERVER, having had experience in the problems of group dynamics the previous quarter, acted as a catalyst to prevent the group from floundering. The INITIATOR proposed study group topics and suggested ways of approaching the material.
3. Classes and retreats were held all over the city of Los Angeles and its environs.
4. Evaluation. At the final session of each Study Group, the participants evaluated themselves and one another, and decided who would be process-observers for subsequent HENAC programs.

5. Community input. Local communities were invited to submit proposals for Study Group topics. Community organizations were requested to allow students to work with them. A budget allowance was made so that each Study Group could invite guest speakers from the community.

The following HENAC courses are only a partial sampling of Community Initiated Study Groups and Student Initiated Study Groups. Community members and students were free to attend sessions in either groups or both.

Some Examples of Study Groups for Fall, 1969

I. Community Initiated Study Groups

WESTMINSTER NEIGHBORHOOD ASSOCIATION, INCORPORATED: WATTS TROJAN HORSE. This study group will work with the Watts Trojan Horse in an effort to create a clearinghouse for community information, and to work with agencies to help low income clients.

HOOPER AVENUE ELEMENTARY SCHOOL. This study group will work within the school and Hooper's community in an effort to improve communication by working with school personnel, parent groups, community organizations, and volunteer programs.

II. Student Initiated Study Groups

PRE-REVOLUTIONARY CULTURES. This study group will attempt to analyze the cultural trends of repressive and alienating societies that have led to social revolution.

IN-PROGRESS STUDY OF HENAC. This group will evaluate and assess the effects of class activities on all HENAC participants and coordinators.

THE U.S. IN LATIN AMERICA. This group will examine the problems of Latin America focusing on the Continent's potential for social change.

CREATIVITY IN SECONDARY SCHOOLS. The study group will study possibilities for creating a secondary school class in which free or creative thinking would be stimulated.

INACCURACIES AND MISCONCEPTIONS IV-F. This study group will analyze who controls America by investigating the behavior patterns developed or enforced by the individual's experiences in a variety of situations, as in the courts, welfare offices, the books read, and the effects of the media.

THE UNIVERSITY IN RELATION TO ENVIRONMENT AND TECHNOLOGY. This study group will deal with environmental issues and the University's responsibilities as an instrument of social change.

ALTERNATIVE FAMILY STRUCTURES IN CONTEMPORARY SOCIETIES: A COMPARATIVE STUDY OF THE ROLE OF THE FAMILY WITHIN DIFFERENT SOCIO-ECONOMIC SYSTEMS. This study group, in the interest of understanding what the family's role is in these critical times, will propose ways to explore how other contemporary societies undergoing major socio-economic change evolve new family arrangements with new values.

THE CYNIC. This study group will examine the rising tide of cynicism as it is reflected in literature, music, and art.

CONSCIOUSNESS-EXPANSION TECHNIQUES. This study group, out of concern for individual alienation, will investigate a number of the current consciousness-expansion techniques (LSD and the hallucinogens; transcendental meditation; chanting; astrology; Zen; Yoga; Western religion; positive thinking; and self-hypnosis) in an effort to develop a way in which the individual might consciously shape his own life.

THE JEW IN AMERICA. This study group will deal with questions and problems of American Jews: What does it mean to be a Chosen People? Who and What is the Jew? What is the Jewish Religion; its origins and present divisions? How do the present divisions differ? Is there Jewish Art? Drama? Literature? Who runs the Jewish community? How is it organized? What does it do? What is Israel's importance to the American Jew? How do they affect him?

RELIGIOUS RESPONSES TO HUMAN NEED. This study group will examine the pressures facing religious communities as a result of change and it will evaluate the communities' responses. This study will include debates within the World Council of Churches, Vatican II, the National Council of Churches and activities of the Priests in Latin America and attempt to discover if there is an "American Theology."

POSSESSION: MATERIALS AND PEOPLE IN THE AMERICAN SOCIETY. This study group will examine the role and importance of possessions and people in American culture.

HISTORICAL DYNAMICS. This study group will examine man's developing concept of himself and his world: does this process have some goal? Does the historical process have its own goals which influence men? The group will explore an individual's self and world view through his creative works (literature, art, music).

PEACE AND FREEDOM. This study group will examine socio-economic problems and their solutions as posed by radical and establishment groups; familiarize itself with the electoral system and political process in California, and develop political skills.

COMPILING AN INFORMATION BANK. This study group will develop a mechanized system available to everyone, which will provide easy access to multiple sources of data generated on campus and in the community.

HISTORY AND ANALYSIS OF STUDENT POLITICAL MOVEMENTS. This study group will examine the history of student political movements, primarily activist ones, in the U.S. in the past five years.

EDUCATIONAL REFORM. This study group will analyze recent trends and innovations in education, especially on the university level.

It is clear that, on the whole, HENAC's programs centered on social problems and social philosophy. This simply represented student and community interest, however, for there were no restrictions on starting study groups in other areas.

In addition to the Study Groups, there were Seminar Groups and week-end Colloquia which dealt with special topics. Three such groups were initiated in Fall, 1969.

> LIFE STYLE. The student will reflect on his personal values and behavior through studying another person.
>
> SOCIAL CONFRONTATION. The student will reflect on how his (values) life-style is affected by social problems and in that way understand how others might be moved to social confrontation because of the effects of social issues in thier life-styles.
>
> A SOCIETAL ANALYSIS. The student will examine the dynamics of American society.
>
> WEEKEND COLLOQUIA. These Colloquia provide students with an opportunity to meet with experts from outside the university for an extended period of time; they also offer students the chance to meet together without the usual time pressures of being on campus.

By interviewing HENAC people, mainly student administrators and student Process Observers and Initiators, several capsule comments about the need for HENAC were elicited:

QUESTION: Why does the Academic Community need HENAC?

ANSWER: A fear exists in the community that the presence of the University in inimical to the interest of the community.

(No studies were cited to bear out this statement, it was a fact of university life taken for granted. The fear seems to be related to the idea that the university is an "elite establishment," designed to better privileged classes of individuals at the expense of--and to the detriment of--other classes of individuals. "Communities" were generally those in ghetto and industrial areas.)

QUESTION: What is the immediate goal of the HENAC programs?

ANSWER: To replace community fear with an interest in the pursuit of learning.

(There appears to be an inferential leap here which is based on the assumption that "fear" of the university is synonymous with "fear" of learning. Thus, if you eliminate one, you automatically eliminate the other.)

QUESTION: What is the long range goal of HENAC?

ANSWER: Among others, to render the University an integral part of the Community.

(This if to be accomplished by offering all courses without costs or prerequisites. The only requirement for community participants is registration with HENAC. However, university students wishing to take HENAC courses for credit or to fulfill graduation requirements must register for the HENAC course as he would register for any university course, but with no additional fees beyond the usual registration fees.)

HENAC courses were subject to evaluation by the University. A summary of the evaluation procedure is taken verbatim from the HENAC brochure:

University Evaluation of HENAC Courses:

It is the responsibility of the Committee on Educational Development (of the Academic Senate) to evaluate HENAC courses. This is to be accomplished in several ways:

1. Examination of attendance records.
2. Noting the use of university facilities by HENAC people.
3. Noting class participation.
4. Determining the advantage or disadvantage to students in the program.
5. Testing changes in student motivation.

Means of Evaluation (corresponding to the above enumeration, respectively):

1. The Process-Observer will record the attendance at each class. (Although attendance is not required.)
2. The University has set aside library study rooms for the exclusive use of HENAC people, use of which is monitored by the University.
3. One person in each class is required to keep a diary of the class, noting roughly what goes on in class discussion. Also, self-evaluation of the class as a whole is concerned with participation. This information is available to the University.
4. For the purpose of the evaluation in the early stages of the program, the University has imposed temporarily the following requirement on each student in each class:

   One paper of any length covering:

   a. presentation of a specific academic question
   b. discussion of the question
   c. an analysis of how the question was or was not resolved--in a particular work or in class discussion--or both

5. The University had not yet decided how to go about ascertaining changes in student motivation.

Within six months of its birth, HENAC died despite $74,000 of Ford Foundation support and extensive participation by students and members of the community.

The "non-participating" administrators claimed that, although class participation was high, interest on the part of "participating" administrators, that is, students who had been acting as Initiators and Process Observers, waned. Without active and energetic student administrators the program could not attain a positive evaluation from the faculty committee. Funds were not allocated for subsequent programs because HENAC no longer showed promise nor the potential for accomplishing its own goals.

Students claim that administrative red tape and faculty apathy toward a program which appeared to minimize their roles caused HENAC's collapse.

Several other allegations about why HENAC collapsed were elicited from people involved in the program:

1. The HENAC program naturally appealed to the more radical segment of the student body to the dismay of many faculty members as well as many administrators.
2. Student administrators, although very anxious to work with Community Groups, tended to maintain a Christ-disciple aloofness which did nothing to improve the image of the academic community, a HENAC goal.
3. The administration and the students, instead of working together, were at constant odds over relatively petty issues, developing of a general feeling of distrust which finally brought the program down to the ground.

VIEW FROM THE THIRD WORLD

Presuming that curriculum is one of the most important strategies of the university, many authorities think that curricular change is a good place to begin a reform of the university. One critic sees curriculum as chaotic architecture, a house thrown together out of unprincipled expediency.[39]

Generally speaking, curriculum, like the university, and eventually like our society itself, can be cited for three basic faults: hypocrisy, irrelevance, and dehumanization. Each fault, of course, means something different to each particular critic and they range from the loftiest authority speaking on the subject ex cathedra to a non-descript, lowly freshman mumbling to himself in a three hundred member Biology I lecture. In the most general sense, it might be useful to suggest what overall implications attach to each fault.

"Hypocrisy" reflects mainly on several characteristics of curriculum. First, its yielding nature with respect to majority (and usually conservative) social pressure; as Robert Byrnes, Chairman of the History Department at Indiana University stated:

> "...we should not be surprised if the curriculum and everything about a college is buffeted by forces outside the college to a greater degree than it influences or creates those forces. Indeed, if we review the relatively few changes in curriculums over the past thirty years, we must admit that these revisions have been made because of pressures from the outside. The college follows, it does not lead. The curriculum reflects the society in which the institution is based; it does not significantly affect or change the society."[40]

Naturally, this process is circular. As university life is an influence on students, so is curriculum. When students move from the university to society, those exposed to the curriculum tend to reinforce society and its values. In time, their children go to the university, and the circle not merely perpetuates itself, but tends to make profound change impossible.

Second, the insistence of curriculum on its own relevance. This characteristic is exemplified by quotes from university catalogs which make various claims about ambitions for preparing "independent thinkers" when in fact, the curricular content is geared to "conform" the student with the existing outside world: to make him a docile citizen. The curriculum (and, ultimately, the university) graduates students by the dozen but it certainly does not produce individuals - independent thinkers - in any great numbers. Our exploitive social system is founded on the principle of competition and one-up-manship. Such a system thrives on individuality so long as most of us think alike, or sometimes even better, don't bother to think at all. What's there to think about? After all, we have a nearly perfect system! In point of fact, it is a nearly perfect system: it predictably fulfills a basic social need to produce the conformist, the traditionalist who will keep it nearly perfect. Perhaps, in these times, it might be totally perfect if we could just change the words that express our goals and acknowledge that trained conformists are all we want!

Third, the tendency of curriculum to mirror the whims of the power elite in at least three ways: by deferring unduly to political leaders (senators, regents, government officials); by cultivating and accommodating nearby corporate officials; and by engaging in classified military research in direct contradiction to the university function to seek and disseminate knowledge. Military ascendancy in the university has been on the decline recently, at least with respect to the ROTC program. However, military research goes on and on to the tune of many millions of dollars each year.

One has only to count the number of corporation executives, ex-cabinet members, politicians and retired flag officers who are serving as Directors or Regents of major universities to appreciate fully the power of the power elite to control the university.

Their influence results in another major student complaint, irrelevance of the curriculum. By diverting curriculum and teaching considerations to government research, student needs get insufficient attention. In short, the presence of military and government research on campuses and the ensuing campus dependence on federal grants for financial support, warps university programs and tends to socialize students so that they don't ask questions or, at least, ask "the right" ones. Thus, Dr. Nowlis, Dean of Students at Rochester University is justifiably concerned that our universities are not imparting to their graduates "knowledge great and relevant enough" to free them from "the immobilizing parochialism...and conventionality" which stifle social ingenuity and social commitment.[41]

Henry Steele Commager, suggests that we jettison "part of the useless baggage that we now carry with us. We can cut down on educational malpractices like innumberable courses..."[42] At the same time, couldn't we eject some Madison Avenue "necessities" that were devised in collusion with corporate concerns without thought to human needs, in the interest of dealing with social alienation? We must begin to understand strict corporate self-interest whose economic motives have relevance mainly to an elite. We must learn how to control an industrial system which has far passed the margin of safety in pushing its goals to the point where they may be imposed as universal - American - political principles. We must see that these are not forces of cohesion and interdependence, but instead, are divisive, for they are pursued in the interest of an elite at the expense of the ordinary citizen.

Indeed, can one distinguish between the relevance of curriculum, the relevance of higher education and the relevance of a social system itself when all three are so inextricably bound to one another? Some thinkers have put forth the idea that society should equate economic rewards and responsibility to the degree with which one strives to harmonize his individual labors with the overall needs of his community. Ironically, through the curriculum, devised for the most part by the university, students are taught instead that economic rewards and responsibility should be equated directly with one's ability to compete with his fellow man and to promote his own narrow economic interests. Can such a social structure and its university and the curriculum of that university have any relevance at all to men who must live together?

Dehumanization is that characteristic of curriculum which, in effect, takes what potentially might have been human beings and indelibly "stamps" out prescribed molds suitable to and fitted easily into conforming niches in society. Technological education, especially, is geared to the production of personnel needed in an expert society.[43] Unfortunately, our technological society, if it really is that at all, is not such a perfect machine. One may be geared to fit, but is there room? Or do we overproduce personnel much in the way we do consumer goods, to be stockpiled in case a corporation may need them sometime, to be diverted to other uses if it's practical, to be discarded if it's expedient? There is no "hard sell" for graduate engineers. They're a dime a dozen. Teaching personnel suffer the same fate. In 1969, a California State College located in an area famous for its atrocious climate had three openings in its English Department at the full Ph.D. level. Despite the fact that the starting salary was very low ($8,400), the College received over 3,100 applications for the three positions. What's going to happen to carefully constructed molds that fail to find holes to fit into? Conceivably, there may be a danger in a mold's not finding a niche, for it may begin to ask itself why it doesn't fit and what it could fit; this could reverse the setting of the molds by producing thoughtful human beings. In any case, those of us who are "doing our thing," or are attending "way out" schools where we find comradeship, cannot delude ourselves that our lot is any better. Indeed, it is probably worse, for we are not merely alienated, but disaffected. There is no peace for us. We must always fight against what we see, yet to no avail. Our frustration is not with the world so much as it is with the utter futility we encounter when we try to change it. We find a margin within which the forces of change are permitted to maneuver slightly and we try to operate within it. Like most margins, though, it is on the fringe. So are we. Like many fringes it can go off the deep end. Will we?

Many university students are similarly troubled. They suspect that they are being processed for purposes which are alien to them, collectively and individually. They realize that the goals of the society which is controlling them and of the university which is "educating" them, may not be in their interest or may be terribly short-sighted. Where is their future in or out of the University? Is theirs and the future of society safe in the hands of the university?[44]

Clark Kerr, near the end of his discourse on the multiversity (the greatest dehumanizer of them all) pondered "how to create a curriculum that serves the needs of the student as well as the research interests of the teachers;...how to treat the individual student as a unique human being in the mass student body."[45] The question could be expanded even further "how to relate student, teacher, graduate, and non-graduate in a social body that does not induce the aggrandizement of one to the detriment of the other."

The entire question, of course, is moot because the system is self-perpetuating, not only as the university relates to it but as government, labor, trade, international relations, production and management, are steeped in it and integral to it. In an age of fantastic media and universal dissemination of information, young people do not have to attend the university to learn the workings of the Republic, to understand the relationship between monied interests and political power, between production and profit, between prime interest rates and cost of living. There is no fine line between competition and exploitation in our socio-economic system; one is the almost indistinguishable adjunct of the other. Some say it's necessary to reform the curriculum for the good of the student, the university, society. Is that possible in a system that has one set of checks and balances at the Constitutional or surface level to protect the "democratic process," and yet another set of checks and balances, controlled by the power elite, which reaches to every depth of the society to protect the oligarchy?

Some examples of the protective system are long standing: political appointments, oil depletion allowances, multi-million dollar lobby groups, corporate tax privileges, the Congressional Committee system, unlimited political campaign spending, tax exempt municipal bond investment, immigration quotas, depreciation of rental property, conditional federal aid to education. More recent examples are federal conspiracy laws, no-knock search warrants, National Guard intervention, state laws limiting political activity, administrative censorship of university newspapers, Presidential criticism of news media.

Instances of the protective system, at the local levels are not always so obvious. We may compare two recent events in California:

(a) An applicant for a teaching position at Saddleback Junior

College in Orange County was called before the Board of Trustees to be queried about his qualifications. During the course of the interview, the applicant objected when he was asked his political affiliation. Board members insisted that they had a right both to ask the question and to use the answer in consideration of the applicant's overall qualifications. He had three clear choices: (1) refuse to answer and be summarily disqualified by the board, (2) lie to the Board and hope that they had not already consulted with the registrar of voters, (3) answer the question truthfully although it would mean certain rejection for the position. The applicant chose number 3 and was rejected for the position. He was, incidentally, employed as a Professor and Department Chairman at nearby Golden West College at the time of his application and appeared qualified in all academic and professional respects. He had simply told the Board, in conservative Orange County, that he was a registered Democrat. No one can say for sure why he was not hired but one can find grounds for suspicion.

(b) One Sunday night in Irvine, where a campus of the University of California is located, a branch of the Bank of America was gutted by fire. Within two hours, the first construction crews arrived on the scene to clean up the mess. Within twelve hours, construction of an entirely new building on an adjacent lot had begun. In only a day and a half, a parking area was cleared and paved, fully grown lawns were unrolled, flowers were blooming, and a brand new bank with a brick foundation and a shiny planted superstructure was in full operation. One could only gasp at the awesome financial forces which must have been unleashed to get the job done so beautifully and quickly. We have spectacular capacity for looking after the needs of the dollar. Hordes of accountants daily pour over endless figures getting every last dollar correct to the last penny. Human needs get somwhat less attention; witness our scandalous infant mortality rate.

There are those who think that curricular change can mean curricular reform, without a change in the basic structure of the university or, even more remotely without any change in our socio-economic system. Their rhetoric is predicated in the firm conviction that budding crops of university graduates will, by virtue of their education, work for the good of all in the society as it stands. They support social work, philanthropy, and culture.

Among this group, and decidedly its most influential segment, are the "powers that be" in the American higher education hierarchy. Some of the "powers that be" are the presidents and past presidents of elite American universities. These universities, in turn, are the "citadels." The public language which emanates from the citadels through the mouths of their leaders, if not inflated, is airy. In presenting crucial contemporary issues, they invoke archaic and esoteric language that obscures not only the problems, but their urgency. Why do they speak so abstrusely? Don't they know how to communicate? Don't they understand the issues?

Almost ten years ago, Harvard's Nathan Pusey spoke these words:

> What Harvard wants more than anything now to give our country and the world is educated men and women... It is her hope that there will develop here generation after generation, now as in the past, thoughtful men who through their beliefs and actions

> will go on to review and strengthen true quality in the world's life; men and women of knowledge and faith who, ready to learn from others, will make an effort at honest appraisal of their culture, will recognize both its strength and its weakness, will try to see these aspects separately and fairly, and who then not complaining or criticizing unreasonably, or turning away in supercilious indifference, will steadfastly set about working where they can-first of all perhaps with themselves- improve that culture and to make not its shabbiness but its goodness available to others.[46]

What was Pusey talking about? What did he really mean? From these words one might surpose Harvard to be a Divinity school caught up in the training of gentlemen-philanthropists. But as lofty as these remarks sound, the institution is quite in line with American pragmatism; Harvard will continue to train men for competitive success - financial, political, social, and scholarly success. It is no wonder that they are able to extend the culture and "to make not its shabbiness but its goodness available to others." But who are those others? And what is its notion of goodness? Has Harvard's production of gentlemen-philanthropists assisted the growth of materialism at the expense of humanism in America? Is Harvard, on balance, a benefit or a liability to society? And since we are simply using Harvard as an example, do universities do more harm than good?

The true American pragmatist delights in the injunction "to improve that culture and to make not its shabbiness but its goodness available to others." It gives the pragmatist license to ego-optimism: its lets him be an achiever among achiever-peers (those "others"). Salvatore Maddi observes that he is the product of an educational emphasis that excludes "endeavors that are primarily communal, comtemplative, or expressive and (includes) endeavors that are primarily individualistic, competitive, and action oriented."[47] Is it any wonder that American society (and its achievers) "...emphasize science and technology more than humanities and art...materialism, practicality, and shrewdness more than idealism and aestheticism, and ...give the laurel wreath for entrepreneural...ways of life?"

If, as Maddi points out, the United States were functioning at a level of marginal subsistence, the country would surely need "an intense achievement orientation." But "when a society is a little further along developmentally, when there is a comfortable standard of living, then too vigorous an achievement orientation interferes in the short run with the richness and depth that life could have, and in the long run with the continuing viability of the society."[48] This is not to say, of course, that social problems in the United States do not relate to poverty, pestilence and racism. They do to an appalling degree. But rather than attack those problems, our society simple-mindedly plugs away at trying to improve an excellence that was achieved long ago but has nothing to contribute to issues we face now. Worse, our society is severely, if not terminally, afflicted with affluent alienation. "The richness and depth that life could have,"[49] it does not have. Will it ever--at the rate we are "progressing" down the wrong road.

That our efforts could be better spent maintaining "a basis for constant renewal and energetic action" because "mature societies need a delicate balance of achievement orientation and something more comprehensively humanistic"[50] has become an ominous truth. To articulate that truth in terms relevant to all levels of society including the "impoverishment alienated" as well as the "affluence alienated," we need a new language.

The problem with Pusey's language lies not only in its aphoristic quotability and almost biblical simplicity, but, more importantly, it sounds meaningful to the "good hearts" of freshly-minted citadel graduates from the American middle and upper-middle classes who, each June, are pushed into the economy like stacks of silver dollars across the teller's counter at Bank of America.

Those of us who know Dr. Pusey and his fine work at Harvard will grant him the license of the podium and allow that his language in this instance was demanded by the tradition of the occasion; it was probably a commencement or a convocation at which he spoke. But there is no escaping the fact that we hear this same language every day of the year in the halls of Congress; that this very same language can be heard in its most sophisticated dialect whenever the President of the United States addresses the American public on matters of serious national concern; that this same language has been echoing through the corridors of the Pentagon and Board rooms of corporations throughout this country

If language in any way shapes the thoughts or attitudes of men, perhaps we must give up our native tongue. We need a language that does not "define," "condone," or "justify,"an antagonistic system but "questions" that system, and "awakens" human beings, and "involves" human beings in humanity. This may be the first step in curricular reform.

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CHAPTER 18

INCREASE UNIVERSITY TEACHING EFFECTIVENESS

Before World War II, the priority order of the goals of institutions of higher education was: instruction, research, and public service. Since World War II, when the Federal Government and other off-campus agencies began to use the research competence of university professors on a large scale, emphasis on undergraduate teaching as the chief purpose of the university has declined. Thus, we mainly reward professors for publishing and give them little credit for good teaching. In consequence, university facilities have become more concerned with research than teaching. This phenomenon is evident in Ph.D. programs which incline students away from an interest in teaching.[1] "College teaching is the only major learned profession for which there does not exist a well-defined program of preparation directed toward developing the skills which it is essential for the practitioner to posess."[2] Many authorities believe that if good teaching were well rewarded, the publish or perish alternative would soon lose its challenge. They also hold that teaching would be enhanced as a career, and both teaching and research would attract more creative and committed people. Perhaps the student activists will convince the powers-that-be that this hypothesis is worth testing.[3]

Since research on an elaborate, government-fincanced scale is restricted to the large, prestigious universities, the problem of improving and rewarding undergraduate teaching will be examined with respect to these institutions only. The opposite phenomenon exists at the small liberal arts and state colleges, where research is precluded by lack of federal financial resources.

The Office of Education reported in 1964 that 85 percent of federal funds for higher education were disbursed for organized research. In 1962, 95 percent of federal research funds in educational institutions were devoted to work in the physical and life sciences.[4] As more funds have been poured into research, the status of academic researchers has risen. Advancement of faculty in universities theoretically hinges on publication of research, teaching effectiveness, and, to a lesser extent, on public or community service and administrative talent. But, in actuality, proliferation of research far outweighs teaching as a criterion for advancement.

Of course, students would benefit most directly from improved undergraduate teaching; students, however, have the least influence in university decision-making, although recently students have been voicing their concern for better teaching loudly enough to have at least a small effect. The American Association of Colleges survey in 1967-1968 found that there were organized protests about the poor quality of instruction in 13 percent of the campuses surveyed.[5] In 1968-1969 about 30 percent of the protest issues at institutions experiencing violent or disruptive incidents (669) involved faculty, academic freedom and hiring and tenure policies.[6]

The Center for Research and Development in Higher Education at Berkeley conducted a survey in the Fall of 1968 to determine professors' ideas about the formal incentive system in their respective institutions.[7] It surveyed six colleges in three states, including a large state university, a large state college, a medium sized private college, a medium sized public junior college, a small denominational university, and a small liberal arts college. The entire faculty was surveyed in the four smaller schools and a random sample of approximately four hundred was selected in the two larger schools; there was a total of 1,069 usable responses. Each full-time faculty member was asked how important each of several criteria for evaluating faculty should be and how important the criteria actually are. The five criteria are listed with partial results in the following table.

Criteria	Actually is quite or very important	Should be quite or very important
	Percent of Faculty Responses	
Teaching effectiveness	39%	92%
Research and scholarly activity	53	63
School service	41	27
Community service	11	21
Seniority	42	14

At every institution, the overwhelming majority of faculty thought that teaching effectiveness should be highly important. At five of the schools, the faculty said that teaching should be more important than research; only at the state university was research deemed equal in importance to teaching. At every institution, faculty thought that teaching effectiveness should be given more weight than it is in salary and promotion decisions. Seventy-two percent of the faculty thought that their college "should have a formal process to evaluate teaching effectiveness." Fifty-two percent of the faculty agreed with the statement, "Students are the best judges of how effectively their professors teach."

In sum, nearly all the faculty in this study stated that teaching effectiveness should be a major factor in the formal incentive system.

How is evaluation of teaching actually accomplished? What kind of information is being used to assess teaching effectiveness? In 1966, the American Council on Education initiated a survey to ascertain current techniques for evaluating undergraduate education.[8] The entire population of higher education institutions was selected for study. Three general areas were covered in the survey: (1) the frequency with which various sources of information are used in judging a professor's teaching ability; (2) techniques used for training new college teachers; and (3) the importance of classroom teaching in evaluating faculty for promotions, salary increases or tenure. The following table reveals the most often-used sources of information in the evaluation of teaching effectiveness, according to the survey.

Source	Used in all or most departments
Chairman evaluation	85.1%
Dean evaluation	82.3
Colleagues' opinions	48.9
Scholarly research and publication	43.8
Informal student opinions	41.2

Where do chairmen, deans and faculty get their information? Since classroom visits are used at only 14 percent of the institutions surveyed and systematic student ratings are used in only 12.4 percent of the institutions, teacher evaluations must be rendered on the basis of hearsay evidence---i.e., informal opinions of students. From the above data, it appears that the professors' publications--information not based on classroom visits, systematic student ratings, or student achievement--are the major considerations used to evaluate his teaching ability. Results from universities (this excludes junior, liberal arts and teachers colleges), indicate that most departments, 70 percent, base their evaluations of teaching on research and publication.

The survey also gathered data on the importance of 13 different factors in evaluating faculty for promotion, salary and tenure. The following table gives partial results.

Percent of Deans checking item as a "major factor"

Factor	All colleges N=100	Universities N=365
Classroom teaching	95.9%	93.7%
Research	46.6	85.7
Publications	39.9	77.6

The above data seems to indicate that, although classroom teaching is said to be a major factor in evaluating faculties, information actually used for this purpose is inadequate. Specifically, the use of rating forms, properly validated and reliable, (whether completed by students, colleagues or administrators), could add greatly to the accuracy of evaluation procedures. However, the ACE survey found that comparatively few institutions use such forms.[9]

Frequency of Use of Rating Forms or Other Special Techniques for Evaluating Teaching Competence

Type of Institution	Percent Reporting Use
Junior Colleges	30.3%
Liberal Arts Colleges	23.9
Teachers Colleges	21.3
Universities	
Arts and Science	26.2
Business	21.3
Engineering	17.3
Agriculture	33.3
Education	23.4

Within the past few years, students have become increasingly concerned about what they view as the poor quality of undergraduate instruction. Perhaps students have always been unsatisfied with teaching quality. Today, there is no question about it. Students are protesting against the firing of a favorite teacher; they are protesting against a university's failure to promote a popular teacher and give him tenure; they are demanding a voice in decision-making which directly affects their education.

Not all student demands involve sensational protests. Students are developing student programs to rate their instructors. They hope their evaluation scales and testing procedures will act as (1) an administrative guide to questions of promotion and dismissal of faculty members; (2) an instrument for improving the quality of instruction; and (3) as a guide for aiding all students in choosing courses and teachers.

According to the 1966 ACE survey, systematic student ratings are not widely used as a source of information about teaching effectiveness; only about one in ten institutions (of the 1,110 institutions surveyed) stated that they are used in all or most departments; 47.6 percent stated that they are not used at all. In fact, student ratings were actually used less in 1966 than they were in 1961. In university colleges, they dropped from fourth place in 1961 to tenth place in 1966 in a rank ordering of various sources of information.

Why do so few institutions use *systematic* student evaluations in evaluating faculty when *informal* student opinions serve as a basis for evaluation at 41.2 percent of all institutions?

Many educators contend that students cannot accurately assess teaching effectiveness. Then why do they claim they rely so heavily on informal student opinions for evaluation? Informal student opinion seems to be the only direct evidence used since chairmen, deans and other faculty use classroom visitation as a method of evaluation very seldom indeed (only 14 percent of the institutions surveyed rely on this technique).

Distrust of the validity and reliability of the techniques used is another reason given for failure to use systematic student ratings. But only 1.7 percent of the 1,110 institutions surveyed reported that any research had been done on the instruments used to rate teacher effectiveness.

In contrast, since 1925 the University of Washington has been engaged in continuing research on their "Survey of Student Opinion of Teaching." The rating form consists of 10 items which reveal a direct statistical relationship ($r = .70$ to $.84$) between the ratings of the 10 items and the students' perception of the degree of help in understanding received from the instructor.

If student opinion is to be tapped at all in evaluating teaching, systematic methods of gathering valid and reliable data need to be developed.

Student-published course and teacher evaluations began in 1924 when "A Confidential Guide to Courses" was initiated at Harvard by the Harvard Crimson, the student newspaper. The latter and the "Supplement to the General Catalogue" undertaken in the 1960's by SLATE, a campus political organization at the University of California at Berkeley, were the pioneers in this endeavor. The purpose of these evaluations is to provide students with detailed descriptions of courses and information on the quality of teaching in these courses. The SLATE "Supplement to the General Catalogue" declares that evaluations can effect teaching improvement, "By encouraging students to desert bad teachers for better ones,....and to help administration and faculty policy makers to recognize that teaching is a learnable skill, distinct from research, still important in the University." And, according to the editor of the "Confidential Guide" at Harvard, a rave evaluation results in a 25 percent rise in a course's enrollment and, the converse is also true. Courses have even been dropped from the curriculum after several succesive bad reviews.

It is reasonably certain that evaluations make "good" courses and teachers popular and discourage students from enrolling in courses taught by poor teachers. But do they improve teaching? This depends on the individual faculty member's willingness to accept the evaluation's judgement and benefit by it. Even the best-conducted course evaluation can be effective only if the faculty is concerned with improving the quality of instruction. As long as promotion and tenure decisions rely almost exclusively on research and publications, faculties will devote their time and energy to research--even though they might prefer to give more emphasis to their teaching duties. It is ironic that in most large universities faculty primarily are hired and paid to do one job, whereas the worth of their services is evaluated on the basis of how well they do another.

The importance of research is not to be minimized. To be sure, faculties are hired and fired according to the numbers of their publications, but that is not the limit of research's effect. Students' learning experiences could be enhanced by a professor who is involved in research and who is willing to share it with them. Students do not argue that research is unimportant, for they recognize that in many fields professors who paid no attention to research would very soon be passing obsolete notions on to them. But students argue that a professor should be adept in communicating his knowledge--in teaching.

Many faculty do not accept student evaluations of their teaching because they doubt that students are capable of accurately assessing a teacher's performance. Gustad points out that students "are virtually the only direct observers" and that they are reasonably competent if they are asked the right questions. Students probably could not accurately evaluate the instructor's knowledge of his field but they could "report on their own degree of interest, whether he got them interested in taking more work in that department." Students are quite able to perceive the instructor's effects on them. They are also perfectly capable of saying whether an instructor has presented the subject in an organized manner, whether he successfully communicated it to them, and whether he seemed interested in it. "One might be willing to say that one valid outcome of good teaching ought to be that students enjoy the experience. Certainly, the contrary position would be difficult to defend."[10]

Students have a decidedly vested interest in what happens in the classroom. They would prefer that the teaching-learning situation be exciting and that teachers be enthusiastic about their subject. Students are naturally biased in their opinions of teaching. But so are administrators and faculty, many of whom seem to think that a Ph.D. is adequate preparation for teaching. They emphasize knowledge of the subject at the expense of the ability to communicate it. The interaction of these two vested interests would make for a complete evaluation of a teacher's competence in the classroom.

J. H. Hexter has defended the "Publish or Perish" dictum as an adjunct to the defense of good teaching.[11] His argument hinges on the refutation of two common assumptions concerning teaching: (1) that all university teaching goes on in the classroom and (2) that all classroom teaching is a pure act of creation on the part of the teacher. Hexter's view is that, in higher education, publications do the most and best teaching. However, he overlooks the importance of personal contact between a student and teacher, which must not be devalued since this provides important functions--namely, motivation and interpretation, along with a sense of where the book belongs in relation to other books and viewpoints.

Hexter also comments on the heart of the whole controversy--the problem of evaluation. It is not enough to say that teaching ought to be rewarded; it is not even enough to separate the good teachers from the bad. A way must be found to rank teachers according to their merit since there will be no way to accurately or adequately reward teachers until some sort of differentiation can be performed. Another problem of evaluation lies in the various kinds of teaching situations that exist in higher education--lecture, discussion, and research seminars, among others. Different methods of evaluation would apply to each of these modes.

If the university is forced to make a choice between two professors, one, an excellent teacher but with no indication that he will ever publish and the other, a prolific researcher with many publications, Hexter contends that the man who publishes should be chosen. He believes the place for the good teacher, who fails to publish, "is not in a great university."[11]

Hexter states that the responsibility of a great American university is to continue to hold the position of the primary generator of new knowledge in the world, a position it has held since World War II, thus insuring that the university will continue to serve the national interest. He does not mention the possibility, however, that such research serving narrow national interest may mean the university risks becoming an important, if indirect, contributor to militarism, in view of the fact that governmental support for research is given mainly in areas related to defense. This orientation definitely introduces a serious imbalance into research and hence into university teaching.

The Ph.D. is the acknowledged ticket for admission to an academic teaching position in most universities. Yet the Ph.D. program is almost entirely devoted to the training of research-scholars. Eighty-five percent of those who receive the Ph.D. each year teach in colleges but never publish. A possible explanation of this is that "(1) 90 percent of the

Ph.D.'s who enter the academic profession each year receive their degrees in 50 institutions, (2) the reward system in these institutions is based essentially on measurable criteria, i.e., research, and (3) professors who received recognition under this system are inclined to rationalize the importance of projecting themselves as research rather than as teaching models."[12]

Not only do graduate schools fail to train students for college teaching but, perhaps more importantly, they fail to give status to teaching. The most sought-after faculty members can pretty well make their own conditions, often stipulating light teaching loads (preferably in graduate seminars), thus, the avoidance of teaching becomes a reward and the status of undergraduate teaching is undermined. In graduate schools, the best students are often offered the more prestigious Research Assistantships, implying that Teaching Assistantships are somehow second-rate. (This is less so in the cases where Research Assistantships are funded by the Office of Economic Opportunity, and there are other exceptions; some universities, for example the University of California and the University of Minnesota, are now paying Teaching Assistants at a higher rate.)

"Not until the teacher-scholar gains status commensurate to that of the research-scholar will the seduction of the faculty into research diminish and the status and preparation of college teachers receive attention. This is a fact of university life which finds expression in the mythology of the 'publish or perish' ultimatum."[13] An argument against the heavy emphasis on research is that the majority of Ph.D. holders who teach at the undergraduate or junior college level are over-prepared for activities they do not peform (research and publishing) and unprepared for those they are obliged to perform (teaching, student advising, curriculum planning, evaluation and test preparation).

How well have faculty been prepared in the Ph.D. program in the art and skills of teaching? Most graduate faculties believe that preparing the researcher automatically prepares the teacher. They reason that a faculty member who has a strong grasp of a particular subject field is also well qualified to communicate his knowledge to others. But of course knowledge of a subject does not guarantee ability to communicate it. Meredith Wilson points out that the widespread disenchantment with the traditional courses found in education departments may be partly responsible for the general view that teaching others how to teach is a wasteful exercise.

The interaction between teaching and research was investigated by the University of California's "Survey of Faculty Effort and Output" in 1968-1969. The following table shows the time spent in various activities.

Time Spent in Major Activity Categories at the University of California

Activity	Average Hours Per Week 1960	 1968
Regular Courses	24	21
Supervision of Independent Studies	7	9
Research	17	19
Student Affairs	3	3
Administration	6	7
Public Service	1	1
Total	60	58

These results could probably be generalized to the other large prestigious universities in the nation. Not only do fewer than 15 percent of the Ph.D.'s having academic appointments do research, but those who do, spend more time on their teaching duties than on their research duties. Yet the reward system is set up so that research and publication are the major criteria for advancement. The survey also indicates that the time spent on research activity has increased over the years and that time spent on courses and independent studies has decreased. (However, it must be pointed out that the above magnitudes of change are small enough to perhaps be due to sampling errors.)

The college professor is unique in that he receives little practice or training for the teaching role of his profession. Teaching assistantships are not adequate for this. Some argue that good teachers are born, not made. It may be true that those rare faculty members that can be called "great teachers" are naturally endowed in the art of teaching; however, most college teachers could probably benefit from some formal training in the techniques of teaching. At the present time, their "training" consists of having observed their former instructors, and perhaps serving as a Teaching Assistant for a year or two, usually without formal supervision.

If graduate schools offered training for researchers only, there would be no opposition to their program. But the fact that 85 percent of their graduates teach and never publish and the fact that, in large universities, faculties spend more than half their time teaching and in teaching-related activities suggests inappropriateness of the present Ph.D. program.

There are numerous suggestions and programs attempting to remedy the situation. A comprehensive survey taken in 1967 by the Michigan Center on Learning and Teaching reported that approximately 450 graduate institutions listed courses or programs of instruction designated to assist beginners in the art and skills of college teaching. Approximately 80 percent of the 450 programs are directed toward students who are working for the Ph.D. The institutions that claim they prepared their Ph.D. candidates for college teaching do not publish reports on how this experience is provided. They also fail to provide evidence about how programs are designed to develop individuals in the art and skills of teaching. Seventy-five percent of these 450 institutions reported that the teaching assistantship was the primary method for preparing future college teachers. Almost all of these institutions utilizing the teaching assistantship claim that it serves as an opportunity for teaching under supervision and guidance. But it was reported that less than half of those who held the T.A.'s received adequate, systematic, or continuous guidance from a senior member of the faculty. Data show that in half of the 50 institutions that produce 90 percent of the Ph.D.'s each year, the program for T.A.'s has remained substantially unchanged during the past decade or more. The fact that 26 percent of the teaching assistants now studying in 10 of the best graduate schools report that they would welcome more emphasis on teaching methods may be viewed as a sign of an increased interest in teaching or a void in their present training.[14]

The Ford Foundation in 1967 announced a seven-year major experimental program to take place in the 10 leading university graduate schools.[15] The program's aim is the improvement of quality and efficiency for P.h.D. candidates. One of the expected outcomes is "to improve the quality of college teaching. In contrast to present practices whereby graduate students usually interrupt their doctoral studies to teach or to divide their time between teaching and study, the teaching requirement in the pilot program will be integrated with the student's degree studies. Improved teaching training, through better supervision of graduate apprentices by regular faculty, will be emphasized."

A study of quality in graduate education carried out at the Center for Research and Development in Higher Education provided data on 2,000 Teaching Assistants, most of them in the above Ford Foundation program. About 75 percent of the respondents reported that the T.A. had increased their interest in teaching; an equal number said that the experience had improved their insturctional skills. However, although 81 percent reported good relationships with their supervisors, 41 percent felt that they had had not been given enough guidence.[16]

It is clear that, to date, training for college teaching in the standard Ph.D. program has not been successful. And as the criticism of undergraduate teaching increases, the debate continues on the question of the need for a new doctoral degree for college teachers. The Center for Research and Development in Higher Education at Berkeley reported that of 1,600 faculty representing 12 academic fields and ten of the best graduate institutions in the U.S., 35 percent favored the introduction of a teaching degree in their field; 20 percent were not certain of the need; 44 percent opposed such a degree. Those who favored the new degree thought that it should be designed for the synthesizers and disseminators of research rather than for researchers per se.

At the University of California, the proposal for a special degree for college teachers--the Doctor of Arts degree--met with indifference because the faculty apparently felt that such a degree would dilute or diminish rigorous scholarship and produce second-class scholars. Although the Ph.D. is thought of as the ticket to an academic appointment, approximately 75 percent of those who enter higher education faculties each year, and 49 percent of all experienced college and university faculities, do not hold the Ph.D.[17] Many of these "Ph.D. dropouts" are A.B.D.'s--individuals who have completed all requirements in the doctoral program except the dissertation. The University of Michigan Graduate School, among others, has "legalized" the A.B.D. by automatically awarding a Candidate in Philosophy certificate to those who complete all the requirements for a Ph.D. except the research dissertation.

Another answer to the question of how to produce competently trained undergraduate teachers is the Teaching Internship. These programs have been supported by various foundations including Danforth and Fund for Advancement of Education (FAE), established by the Ford Foundation. Teaching Internship Programs take a somewhat different tack in the preparation of college teachers; training occurs after the Ph.D. is awarded--similar to the residency internship of the medical student.

In 1953, the FAE funded internship programs for beginning college teachers at 19 colleges and universities. Generally, the intern was given a reduced teaching schedule to permit him to study problems of higher education and teaching. The principal ingredients of the Internship program included:

1. A selected training assignment which will give the intern a fair perspective of different types of teaching situations as an attractive introductory experience in teaching.
2. The establishment of a responsible and fruitful relationship between the intern and one or more experienced members of the faculty.
3. An organized program including a seminar which focuses on problems of teaching and aims and characteristics of liberal education, along with the opportunity to observe good teaching and be observed, to work with students outside the classroom and to see the institution as a whole and the intern's relationship to it.[18]

The internship program, where training for teaching occurs after the Ph.D., is probably more satisfying to those who believe that the college teacher must first become a scholar via the traditional Ph.D. program, for only then is he sufficiently versed in the subject matter to teach it. The internship program's purpose, then, is to take a well-educated scholar and help him become a competent teacher.

A two-year joint project to improve college teaching was undertaken by the American Association of Colleges and the American Association of University Professors, in the Fall of 1969. The three part program, which is still in progress, consists of career development of the effective college teacher, evaluation and recognition of the effective college teacher, and optimum working conditions for effective teaching. The project expects to investigate, in detail, current methods of evaluating teaching so that it can make recommendations to improve evaluation. The group's basic assumption is that satisfactory ways of evaluating teaching are the necessary steps toward achieving the goal of rewarding good teaching. They believe, too, that the current student-published evaluations are made on too narrow a basis and cause faculty anxiety.[19]

In the 1966 ACE survey, 36 percent of the 1,110 academic deans replied that their institutions gave an outstanding teacher award.[18] The nature of the awards varied; cash prizes ranged from $100 to $4,000. Most of the respondents indicated that students were involved in the selection process, followed by faculty, administration, and, finally, alumni participation.

Perhaps the most elaborate program of teacher awards was undertaken by the State of Oregon. In 1965, the Oregon Legislative Assembly voted to allot $500,000 during 1965-1967 for the seven institutions of the State System of Higher Education to use for providing grants to teachers of undergraduate courses. The Legislature stipulated that "students shall be involved in either the nomination or selection of grant winners. They may be involved in both nomination and selection." The goals of the program were three-fold:

1. To signify the great importance attached to high quality undergraduate teaching by the Legislature, the State Board of Higher Education, and the institutions of the State System.
2. To reward, by monetary grants, those faculty members who devote a significant portion of their time to undergraduate teaching, and who have demonstrated an uncommon ability as teachers of undergraduates.
3. To encourage faculty members of outstanding teaching ability to remain in undergraduate teaching, or to return to undergraduate teaching, by providing them with incentives to offset incentives offered by research and other non-teaching activities.

In the first year of the Merit Award Program, five of the seven eligible institutions elected to participate; the second year only one institution wished to continue. Obviously, there was a great deal of dissatisfaction with the plan on the part of the faculty. Some of their objections were the following:

1. Faculty concern over what they considered legislative involvement in matters which the faculty felt should be internal to the institutions.
2. Faculty unwillingness to accept the assumptions they felt to be implicit in the plan--that the institutions were doing nothing of their own volition to reward and to encourage effective undergraduate teaching. Faculty members insisted that teaching

effectiveness was a factor in measuring merit as a basis for salary increases.

3. Awarding money to individuals as "prizes" is an inappropriate and ineffective way of improving undergraduate teaching; rewards should be reflected to salary increases rather than in "prize" money.
4. Concern that the distribution of $1,000 awards to a small fraction of the faculty, with attendant publicity, could create a divisiveness destructive of faculty morale.
5. Many faculty members believed it impossible to measure teaching effectiveness with sufficient precision.

Most of the faculty thought that if the goal of the Merit Award Program was to encourage the improvement of undergraduate teaching, there were more effective ways to achieve it than to reward teaching excellence.

A request was made to the Legislature in 1969 for an appropriation of one million dollars for the years 1969-1971 for the "improvement of instruction" in Oregon's State universities and colleges.[21] The funds would be used for projects, such as establishing centers for Educational Experimentation, Innovation and Improvement at each institution, supporting faculty projects such as the development of innovative courses of undergraduate instruction, experimenting with the use of television and videotape techniques in instruction. The views on the recognition of teaching performance in appointment, promotion, tenure and salary policies, however, was expressed in this way: "This is a perennial problem in college and university administration. There is no easy solution, given the difficulties of assessing teaching performance on other than subjective reports and hearsay evidence. But it is a problem which needs continuing attention, however remote may appear any truly satisfying solution."

The preceding arguments for increased teaching rewards are based on trying to improve teaching by directly altering faculty reward systems, an approach which has met with much resistance from faculty members. Another possible approach would be to treat the faculty reward system as an outcome variable. For example, it might be fruitful to investigate the effect of drastically reducing research funds (this seems to be happening now as a result of the transition to a peace-time economy), or the effect of transferring university based research (this seems a distinct future possibility as a reaction to recent bombings on campuses). Conceivably, one outcome of these changes could lead to a greater emphasis on teaching in universities and, thus, to a greater emphasis on faculty rewards for teaching.

At present, a faculty member's rewards for teaching are personal ones, is so far as his income and prestige do not very greatly hinge on his effectiveness in the classroom. His rewards for doing research, however, are quite tangible in terms of salary increases, tenure and national visibility; he gains prestige from his colleagues through his contribution to the literature of his profession and from the administration in the form of praise for bringing grant funds to his institution and thereby increasing his school's prestige.

Since the students are the ones who would benefit most from an increase in teaching rewards, perhaps they are the ones who should have the power to determine the financial rewards of the faculty that teach them. "An economist would be shocked that students, as consumers of even an admittedly intangible product, have so little quality control over purchasing in the academic 'supermarket'."[22] Groves has suggested one way to give students more control over rewards offered to the faculty: have students pay tuition in proportion to the amount and quality of instruction purchased, with students contracting for teaching services, more or less directly, with the individual faculty members or with outside experts.[23]

Many of the following recommendations depend on developing procedures for defining and measuring good teaching--in both cognitive and affective terms. A most important, if not the most important, precondition for increased teaching rewards is an understanding of what factors combine to make good teaching.

SUGGESTIONS FOR INCREASING TEACHING EFFECTIVENESS

1. If a favorable evaluation in a student-published, faculty evaluation program could be considered by the faculty as a teaching reward, perhaps this method could act as an incentive to improve the quality of teaching. However, one need not be called skeptical if he suggested such praise could not compete with the more tangible rewards of research. More directly, students might have more decision-making power with respect to teaching in evaluating faculty for promotion and tenure.
2. Change the time schedule for evaluation of new faculty members (American Association of University Professors). If new professors were not pressured to publish so much so early in their careers (much of it unnecessarily make-work), they could develop their teaching skills along with performing research.

3. Require that Ph.D. degree include training in college teaching. Many graduate students perform as teaching assistants, but with almost no supervision or training.
4. Introduce an internship and residency program which would come after the completion of the doctorate. The salary would be comparable to what Ph.D.'s get now and would be a pedagogic counterpart of a post-doctoral fellowship for a researcher. This would not be an extension of graduate training as much as a modification of the working conditions for assistant professors.
5. Give students more control over rewards offered to the faculty (and, hence, their own education); make the student financially independent of his department (guaranteed fellowships paid directly to him). Students might pay tuition in proportion to the amount and quality of instruction purchased, contracting for teaching services directly with an individual faculty member.
6. Although it is said that teaching is a heavily weighted factor in promotion, it is not, for evaluating good teaching is difficult.
   a. The initial step in evaluation is defining good teaching.
      (1) A clear statement of the objectives of a course and what is good teaching in that subject.
      (2) A clear statement of the purposes of a particular institution and what is meant by good teaching in that institution.
   b. How to evaluate?

      The ultimate criterion of effective teaching is desirable changes in students, not only cognitive (testing student achievement including pre-testing), but also affective (lack of adequate instruments and norms). Also, certain variables must be factored out such as student motivation, commitment and participation, etc., in order to measure changes caused by the quality of teaching. A problem with immediate testing, however, is that many of the significant outcomes of good teaching may be long-term benefits and not be apparent for years.

7. Another proposal (which doesn't seem to have wide faculty support) suggests dividing departments into two sections, one for teaching and the other for research. In this way, some faculty would be hired primarily for teaching and some primarily for research.
8. Create a new degree in college teaching. (Although this degree might attract fewer talented people and would possibly have less status if it is stereotyped as a "soft" option for those who can't make it in research.)
9. The Federal Government might devise financial rewards for good teaching, especially since the influx of federal monies to university research is largely responsible for the imbalance that exists between rewards for research and teaching.

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[12] A. W. Astin and C. B. T. Lee, *op. cit*.

[13] Ann M. Heiss, *Doctoral Education*, *op*. *cit*.

[14] Ann M. Heiss, *The Preparation of College and University Teachers, (Berkeley: Center for Research and Development in Higher Education).*

[15] Ford Foundation, "New from the Ford Foundation" (New York: Ford Foundation Office of Reports, April 9, 1967).

[16] Ann M. Heiss, loc cit.

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[18] John S. Diekhoff, Report of the College Faculty Internship Program (New York: The Fund for the Advancement of Education, 1959).

[19] "Special Report on Evaluation of College Teaching" Joint Project to Imrpove College Teaching (Washington D. C.: AAC and AAUP).

[20] Office of Academic Affairs, A Plan for the Improvement of Teaching in State Institutions, 1969-1971, Progress Report I Presented by the Office of Academic Affairs of the Oregon State System of Higher Education to the Board's Committee on Academic Affairs, May 21, 1968.

[21] Office of Academic Affairs, A Plan for the Imppovement of Teaching in State System Institutions, 1969-1971, Progress Report II, presented by the Office of Academic Affairs of the Oregon State System of Higher Education to the Board's Committee on Academic Affairs, February 17, 1969.

[22] Eugene W. Groves, "For What Is all this Knowledge?" in Whose Goals for American Higher Education? ed. by Charles G. Dobbins and Calvin B. T. Lee, (Washington D. C.: American Council on Education, 1968).

[23] Ibid.

CHAPTER 19

VOLUNTARY COOPERATION FOR EFFECTIVE RESOURCE ALLOCATION IN HIGHER EDUCATION

INTRODUCTION

If growth in absolute terms is indicative of the vitality of a movement, the interinstitutional cooperation ranks among the most vigorous movements in American higher education. Within this bustling domain of institutional coalitions, one particular type, commonly referred to as the consortium, has been promoted as a means for improving the marginal existence of colleges and for better utilizing the resources of larger institutions. This paper sets the stage for examining the effectiveness of voluntary interinstitutional cooperation first by discussing the domain of institutional relationships and relating the consortium to this larger framework; second, by pointing to some key issues which are raised when the question of interinstitutional cooperation is viewed in the light of six functions of higher education; third, by listing nine purposes which colleges and universities give for joining resources in some common program; and fourth, by examining a select group of outputs which might be usefully employed to evaluate the effectiveness of cooperative efforts.

THE INTERORGANIZATIONAL SPECTRUM

American higher education is typically characterized as a diverse, decentralized structure composed of autonomous private colleges and universities and their public counterparts juxtaposed to some extent in competition with one another. In the absence of a strong national educational bureaucracy and a well-defined vertical flow of authority and decision-making processes, individual educational units have sought the more informal structures of alliance and confederation.[1]

These alliances are not limited to regional interinstitutional agreements, of course. They are found in the form of national associations with both institutional and individual memberships; they are found in the form of interstate compacts such as the Western Interstate Commission for Higher Education; they are found in the form of interinstitutional compacts such as The Associated Colleges of the Midwest or The Kansas City Regional Council for Higher Education which reach across state boundaries; they are found in the form of cluster colleges which locate in close proximity to one another for purposes of mutual benefit. And this list is by no means exhaustive of imaginative relationships which presently serve the cause of higher education.

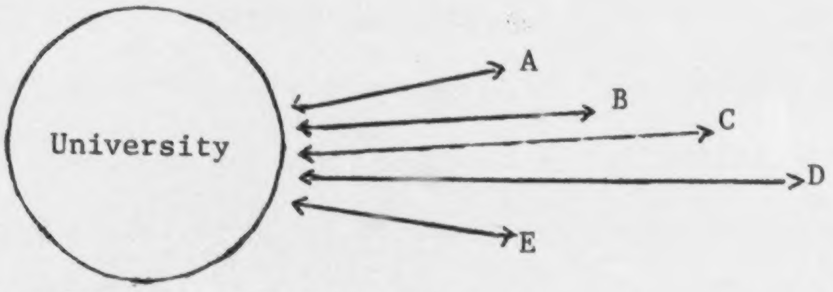
While many of the interinstitutional organizations or systems are tied together through statutory acts, many more are voluntary in nature, the product of either an informal, in some cases unwritten, agreement of institutional leaders or a contractual arrangement which affords the individual institution an escape-hatch clause should the alliance at anytime prove more costly than beneficial. The statutory or public systems are more likely to tend toward the bureaucratic type of organization, whereas the voluntary confederations in which the parties are bound together for a limited number of activities requires different processes for developing authority, setting standards of work, assigning personnel, providing for a flow of new ideas, and solving problems.[2]

DEFINITIONS, PATTERNS AND PURPOSES OF VOLUNTARY INTERINSTITUTIONAL COOPERATION

The Higher Education Consortium

In an exploratory study of the extent of cooperation among institutions of higher education in the United States (1965-1966) Raymond Moore first employed the term "consortium" in speaking of cooperation between institutions. He gave his definition of a consortium--"an agreement whereby two or more institutions--at least one of which is an institution of higher education--agree to pursue between, or among, them a program for strengthening academic programs, improving administration, or providing for other special needs." In his tally of the number of cooperative ventures which fit this definition, Moore specifically excluded educational associations, regional laboratories, clinical affiliations of medical and paramedical curriculums, and student-teaching arrangements between colleges and schools.[3] The reason for this exclusion was not given.

Although it may be inferred from Moore's report that a considerable amount of cooperation reported either directly or indirectly was informal and quite casually regarded by its participating members, the extent of reported cooperation is still noteworthy. In a universe of 1,509 institutions which granted at least the Bachelor's degree, Moore found 1,017 cooperative programs. Of this number 66.2 percent were bilateral, involving only two institutions; 33.8 percent or 344 programs involved three or more institutions. The number of bilateral programs is large because of the practice of the large universities establishing informal bilateral agreements in specialized academic areas with neighboring institutions as a means of supporting graduate programs. Such agreements tend to remain bilateral instead of leading to a cooperative arrangement involving a sharing of resources among all participating institutions.



A Common Pattern of University-College Bilateral Relationship
Example 1

Each branch in the example above is reported as a separate consortium of two member institutions (bilateral) in Moore's study. A distinction among types of bilateral (single, fraternal, federated) cooperation is made by Moore in a paper read for the Wisconsin Conference on Interinstitutional Cooperation in Higher Education (March 3-4, 1967). The single bilateral consortium involves one college and a university, the fraternal involves several colleges separately cooperating with a university, and the federated involves a mid-ground between multiple bilateral agreements, as in Example 1, and a true multi-lateral cooperative pattern.[4]

While Moore's work in mapping the boundaries of the interinstitutional cooperation helped to draw attention to the vast amount of activity about which too little information is available, it was just the first important step in the huge task of bringing some order to the field of educational alliances.

A significant contribution to this effort was made by Lewis D. Patterson (The Kansas City Regional Council for Higher Education) in his development of a set of criteria for "academic consortia." These criteria have become the basis for a directory of 55 consortia (1970) fitting this definition. These criteria indicate that each of the consortia listed is

1. a voluntary formal organization (with)
2. three or more member institutions
3. multi-academic programs
4. specific programs administered by at least one full-time professional, and (is partially supported by)
5. required annual contribution or other tangible evidence of long-term commitment of member institutions.[5]

It is at once apparent that a consortium composed of several members cooperating on several academic programs creates considerably more administrative complexities than a bilateral consortium even though the latter may be involved with several programs.

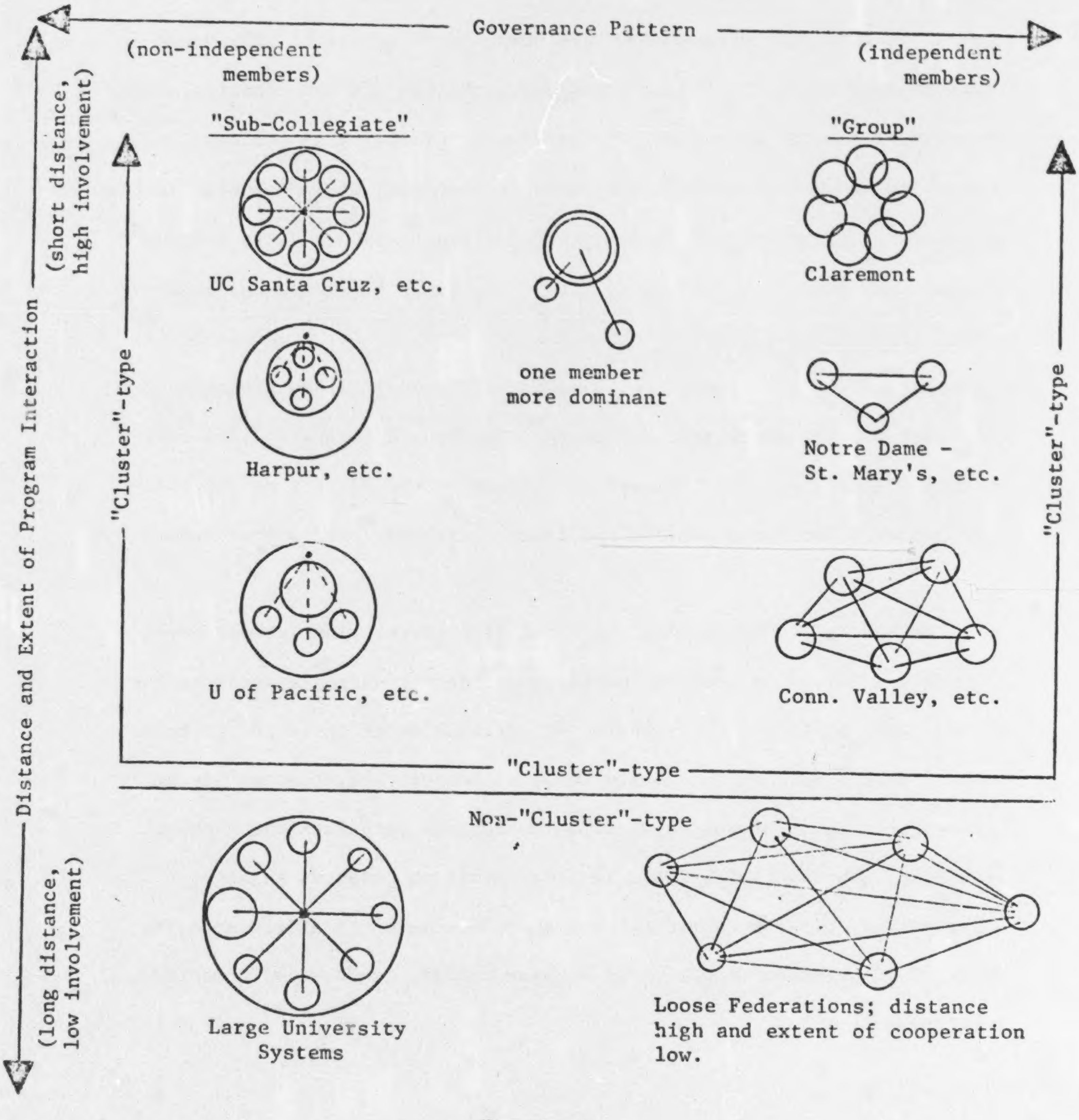
Without denying the opportunities for increasing institutional effectiveness through the simpler bilateral arrangements, I will focus the remainder of the discussion on matters more directly related to the consortium as defined by Patterson's five criteria. It is our belief that the more complex cooperatives have both the greater potential for creating substantial increases in the effectiveness of higher education generally and, because of their complexity, the greater need of study and evaluation. It may be assumed, then, throughout the following pages that all references to consortia or interinstitutional cooperation should be taken to mean the complex type.

Patterns of Consortia

Both the physical patterns and purposes of voluntary interinstitutional cooperation have received the attention of students of the consortium movement over the past several years. Most of the work produced by these writers deals with these subjects only on the descriptive level, leaving for future researchers the unanswered questions of how the patterns and purposes are successfully interrelated.

The best known of the physical arrangements for interinstitutional cooperation is the closely-situated Oxford arrangement currently spoken of as the "cluster college."[6] In its ideal form the cluster college consists of a small group of autonomous colleges located in close proximity to one another so that the costly facilities such as libraries, auditoriums, and highly specialized scientific equipment can be shared among the faculties and students of all institutions. Such physical proximity generally occurs either from the establishing of new institutions next to an already existing one (The Claremont Colleges) or within an already

A DIAGRAMMATIC REPRESENTATION OF COOPERATIVE ENDEAVORS AMONG INSTITUTIONS-PROPOSING THE RELATIONSHIP OF CLUSTER EFFORTS TO OTHER TYPES*



Example 2

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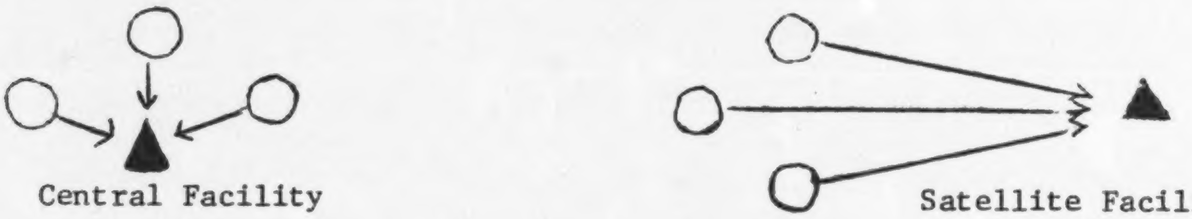
*This diagrammatic representation was taken in toto from H.R. Kells' chart found in a bound volume of working papers collected for the Claremont Conference on the Cluster College Concept, March 30-31, 1967. See footnote 7.

existing university (University of the Pacific), or from the planning of a complex campus of semi-autonomous colleges (University of California, Santa Cruz).

Not all cluster arrangements are composed of separate, autonomous institutions, hence cluster colleges and consortia are not identical sets. The cluster concept emphasizes the geographic proximity of colleges; the consortium concept emphasizes the inter-relationship of independent institutions. An illustration of how cluster colleges may vary with respect to these two dimensions of relatedness, geographic proximity and independence, is given in a diagram (Example 2) which H. R. Kells developed for a conference on "The Cluster College Concept" funded by the Carnegie Corporation of New York and held at the Claremont Colleges in 1967.[7] In this illustration the consortia are found on the right side (independent members) and these include the loose federation of the non-cluster type.

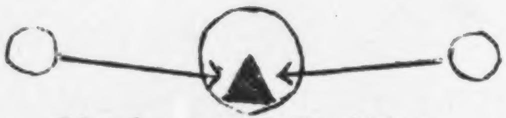
The Kell diagram hypothesizes a positive correlation between geographic proximity and program interaction (see the verticle arrow on the extreme left of Example 2). While the correlation of these two factors must certainly be high in certain kinds of cooperative programs (e.g., cross-registration of students taking courses on more than one campus, sharing of library facilities), in other kinds of programs adjacent locations may offer no advantage and therefore have no effect upon the level of cooperation (e.g., joint studies abroad, cooperative computer facilities, etc.)

Often the voluntary, non-cluster consortium is composed of institutions which are spread over a wide distance from one another. The cooperative arrangement may or may not involve a special facility for the interinstitutional program. Where a cooperative facility is maintained the patterns shown in Example 3 are possible.



Central Facility

Satellite Facility

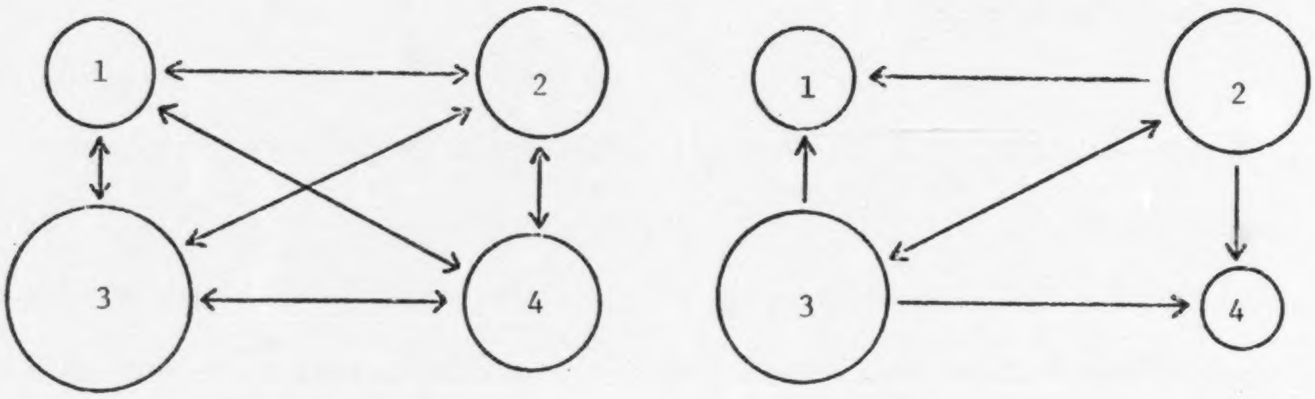


Singly-owned Facility

Example 3

Each arrangement serves a particular purpose best. The central facility is most successful when a large amount of traffic between the institutions and the shared facility is necessary. The satellite facility is appropriate in programs where the location of the students in a special environment not available on any of the campuses is necessary (e.g., an urban studies center, a foreign campus, or a Marine Sciences center). The singly-owned facility often occurs when an institution has an expensive, on-going program which it finds economically necessary to share with its not-so-favored neighboring institutions. While the sharing of both the benefits and costs generally results in more efficient use of such facilities, the higher availability to the institution which has possession of the facility, the de facto control which this institution exerts over the use of the facility, and the loss of prestige which the faculty and students from the other institutions may feel in having to use the facility of a neighboring university may all combine to create a very unstable arrangement. While in the short run the arrangement may seem to be the only reasonable one when finances are considered, in the long run, such an arrangement is politically difficult to maintain because of inter-campus jealousies.

Whether or not a separate facility is involved in the cooperative agreement, such joint programs must involve a reasonably equal input of resources by all participating members. It is not unusual to find a wide range of size and affluence among the colleges and universities in consortia. It is unusual, however, to find a program of any duration in which the major portion of the burden has been borne by a single institution or a small subgroup of the membership. To illustrate, in Example 4 consortium A would have a greater probability of success than consortium B because the cooperative relationship between the institutions is mutually beneficial. The arrows in this diagram may represent either a flow of benefits to the receiving institution or a sharing of resources from the issuing point of the arrow. In either case, consortium B obviously presents a problem of disequilibrious cooperation since institutions 1 and 4 are only on the receiving end.



A

B

Example 4

THE CONSORTIA AND THEIR IMPACT UPON SIX FUNCTIONS OF HIGHER EDUCATION

Now from the level of voluntary interinstitutional cooperation, let us examine what difference such confederation makes in the implementation of six important functions of higher education, what the term "efficiency" means in a cooperative context, and how the evaluation of consortia might proceed. The questions which arise are as applicable to a consortium of two institutions as they are to a much larger grouping. The fact that the larger, complex, more formal consortium with a central staff usually has the greater visibility should not cause us to overlook the broad spectrum of relationships between colleges and universities which exist and the contributions of these relationships to the effective administration of higher education.

The Sorting Function

One of the functions of higher education is to channel students into or out of college, into or out of various professions; to determine to some extent the level of income students will enjoy; to determine to some extent who their business associates and friends will be. The question can be put--what effect does interinstitutional cooperation have upon this function? The evidence is not readily obtainable, but let us examine the possibilities at two points in the higher education process where sorting takes place: (1) at the point an applicant is admitted (or not admitted) to college, and (2) at the point the matriculated student decides upon an area of specialization.

Entrance standards at colleges and universities are sensitive institutional issues very closely tied to institutional objectives and self-image. These standards are generally not subject to negotiation in a consortium. The result is that whatever the sorting standards are that obtain at this level, they remain largely unaffected by cooperative programs. It is conceivable that through cooperation one might increase the effectiveness of these standards (but not change them) by providing more educational alternatives for the type of student desired and consequently attracting more of this type to the university.

During the course of the college career, the sorting function directs college students toward specialized careers by making available a limited number of options (courses of study) from which they may choose. In this case, a student who attends a consortium institution has an appreciably increased set of options from which to choose, if the consortium allows liberal course exchanging among its campuses. Here the options could make the difference in a marginal student's staying to complete the degree program or dropping out. No studies have been located on this problem yet, but the hypothesis could make a worthwhile research topic.

Another interesting and relevant question is raised if one considers the sorting function to apply not only to economic sorting but also to racial sorting. In this regard the impact of inter-institutional cooperation in the South between predominantly white and predominantly Negro institutions is of considerable importance. One of the many which could be cited is the cooperative course co-sponsored by Bethune-Cookman College and Stetson University which is described by President Paul Geren of Stetson University in the following statement:

> The idea of the joint seminar is to multiply the resources and the sense of community which universities can bring to the study of social conflict. We are in the combination of a city and a town, Daytona Beach and DeLand; two educational institutions, Bethune-Cookman College and Stetson University--both desegregated, Bethune primarily Negro and Stetson predominantly white. We have civic members from both communities--municipal officials, school board members, professional persons, housewives. We include persons whose academic disciplines are sociology, economics, political science, education, law and the humanities. We have an array of social conflicts in mind: inter-racial, law enforcement, housing, juvenile problems, schools. The combination we are striving for is the view in depth from many perspectives. We hope to understand social conflict, including its complexity, difficulty, pervasiveness, and to develop some practical ideas for healing.[8]

Institutional cooperation and the sorting function intersect at yet another point where the separate education of the sexes is still practiced. The sorting criterion is based on sex rather than scholastic ability, family status, or race. The contribution of cooperation in a consortium presently composed of two women's colleges, one men's college and a coeducational university (with a fifth new coeducational college being planned) was put this way.

> If the single-sex colleges choose not to become coeducational, five-college cooperation may enable them to develop distinctive patterns, so that they can both retain the advantages of their present system and achieve some advantages of coeducation.[9]

To the present time, with the exception of the case studies of Southern institutions quoted above, no research data have been uncovered which might illuminate this area of higher education. The effects of institutional cooperation in increasing options available to students may be inferred from data recording the amount of course exchanges taking place in various consortia, but the effect upon the sorting function is still in the realm of speculation.

The Occupational Training Function

Alliances between institutions for improving the occupational and professional programs through planning and sharing information are not new. This is essentially the purpose of most professional associations and at this level of operation they are effective in bringing about prescribed changes as a result of the peer pressure and accrediting processes. But this level is more nearly what has been defined as supra-institutional in that it involves a membership of nearly 100 percent of the leading institutions in any single occupational or professional area.

The potential benefits of cooperation among similar professional schools or departments which are oriented toward occupational training are virtually the same as those for the liberal arts-oriented campuses. There are, in fact, greater efficiencies to be achieved in the use of financial resources because of the greater expenses associated with many kinds of occupational training, professional or otherwise.

There is some indication that inter-institutional cooperation may in the near future, involve both institutions of higher education and industry, business, or governmental organizations in much more carefully planned relationships than in the past. The improvement of the occupational function of the college or university in the interface of training with practice would be considerable. A recommendation by the Engineering Advisory Council, 1964-65 of the University of California, could result in consortium programs of consequence to engineers.

> Industry-University Collaboration. The schools of engineering, in conjunction with the Council of Engineering Deans and the Engineering Advisory Council, should take prompt and vigorous steps to achieve mutual advantages of close collaboration, in both regular and continuing education, with the many willing and able California industries and governmental agencies.[10]

This pattern could well be duplicated in other areas of the university curriculum. The engineers may yet duplicate the leadership role they played when Professor Herman Schneider inaugurated cooperative education (work-study) at the University of Cincinnati in 1906.

The Research Function

As a result of recent criticism of the "flight from teaching" on the university campus and higher education's involvement with military research during an unpopular war, the research function of the university is currently the focal point of much unfriendly scrutiny. The massive appetite for resources which the search for and generation of new knowledge requires is recognized by both the supporters and detractors of research on campus. Several patterns of institutional cooperation have developed recently which promise to improve the efficiency and effectiveness of research efforts by combining and sharing resources, and by seeking joint funding from federal agencies. Two well-known examples are the consortium which operates Brookhaven Laboratory and the recently formed University Research Association which will operate the National Accelerator Laboratory; both of these were created to share the tremendously costly facilities necessary for research in high energy physics.

The Consortium Research Development Project (CORD)

Through the Bureau of Research of the U.S. Office of Education funds are made available to consortia of colleges for strengthening the educational and institutional research capabilities of their faculties and administrators. Fifteen groups of institutions across the nation receive or have received CORD support for projects similar to that reported by the College Center of the Finger Lakes (CCFL) in which the objectives were

1. To organize through a coordinating Research Committee a mechanism to stimulate and promote educational research at the member colleges.

2. To develop and support a program of seminars, workshops and demonstrations devoted to communicating to faculty and administrators of the nine colleges and the basic and more advanced methodology of educational research and research administration.

3. To encourage qualified faculty and administrators to develop educational research projects and to assist them in obtaining support for these projects.

4. To initiate common educational research projects in the nine colleges designed to clarify the role of the private liberal arts college in an era of expanding public higher education.

The report on faculty research in the nine member institutions of CCFL listed 287 research projects completed or in progress among their 900 faculty members.[11]

"The Argonne Semester" of the Associated Colleges of the Midwest

Among the 21 cooperative programs sponsored by the 12 liberal arts colleges of the Associated Colleges of the Midwest is the research-oriented "Argonne Semester." This period of study at the Argonne National Laboratory "makes it possible for undergraduates to work with scientists who are doing research on current problems, using the most modern scientific instruments."[12] Faculty members from the biology, chemistry and physics departments of the ACM colleges share in the resources of the Argonne Laboratory. The normal residency for a visiting student at the laboratory is six months (occasionally eight months may be arranged for); for the faculty member, 15 months.

What the cooperative "Argonne Semester" program offers in research opportunities for students and faculty of ACM can be paralleled to some extent in the social sciences through the expanded use of the various urban studies centers as social laboratories. The extent to which such use is being made of the growing number of cooperative centers will soon be disclosed by a study of urban research consortia currently underway by J.G. Paltridge of the Center for Research and Development in Higher Education at Berkeley.

The Inter-University Consortium for Political Research.

The Survey Research Center (Ann Arbor, Michigan) has developed a program of multiple bilateral cooperative arrangements with 133 colleges and universities throughout the nation and in a number of foreign countries for the purposes of facilitating the advanced training of social scientists in research methods and centralizing major bodies of data primarily in the area of political behavior. While the administrative organization of this particular consortium does not correspond to the complex multi-lateral organization reserved as the focus of this discussion, the cooperative data centralization program suggests several possible applications to fields of interest which the more complex consortia ought to examine (e.g., a cooperative institutional research data bank, regional demographic and historical files, regional enviromental data bank).

Such centralization of information encourages and facilitates research by reducing certain natural barriers the researcher generally encounters.

> A major goal in the operation of the repository is to relieve the individual researcher of all possible costs in carrying out his research. Since time is one of the scholar's most valuable commodities, the repository is organized and administered to minimize the lag between specification of data needs and access to the data. A corollary of the emphasis on institutional support for all Consortium activities calls for elimination of all capital investment and overhead charges to the individual user of the repository. An extension of the premise of institutional participation has led to the policy of levying marginal or incremental costs of data rerieval and processing for research needs only where very major analysis projects are involved. All costs of consultation and technical assistance and more costs of data preparation for dissertations and small monographs are borne by the operating budget and are, therefore, essentially free to individual Consortium participants. This policy will be implemented as long as it is financially practicable to do so.[13]

The Organization of Knowledge Function

One of the central functions of the higher education community is the gathering together and the organization of knowledge. This occurs in such diverse activities as the building of a library collection, the development of curricula, course outlines and lectures for instructional purposes as well as in such peripheral activities as the writing and publishing of textbooks and scholarly materials. These activities are carried out with varying degrees of vigor on campuses.

In the healthier campus environments, new sources of knowledge and new ways of transmitting knowledge are sought out with considerable energy. In short, the students, faculty, and administrators recognize the dynamic nature of this critical function and consciously support one another in their efforts to improve the teacher-learning process.

The contribution which interinstitutional cooperation brings to this function is an indirect one, but it is one which produces noticeable results on many campuses. The contribution is a substantial increase in the number and strength of communication links formed between all levels of academic personnel on a campus and other educators or other segments of the world beyond the campus. These links, if they are relevant to the educational program as they are assumed to be in an academic consortium, can have a significant vitalizing effect upon the intellectual climate of the campus. It is likely of course that this effect will be more strongly felt on the small college campus, but the larger institutions are not without their parochialisms, the amelioration of which can be observed when cooperation with other institutions is seriously undertaken.

The Union for Experimenting Colleges and Universities (formerly the Union for Research and Experimentation in Higher Education), composed of eighteen member institutions from California to Vermont and from Wisconsin to Florida, represents the type of purposeful cooperation for experimenting with new educational ideas which organized consortia can support. The Union which maintains its central office at Antioch College was founded by ten institutions in 1964 for the purpose of encouraging and carrying out experiment and research as an integral part of the educational process of each member institution. The sponsoring of a newsletter on innovations in education (Notes), the coordinating of student exchanges in the off-campus programs which each of its members maintains, and the implementing of a three-year project (Project Changeover) designed to help sixty college faculty members develop and try out new methods of teaching--these are among the Union's many accomplishments which help to improve the educational processes of each member institution.

The General Education Function

The current trend toward more guided educational experiences away from the campus is one of the most important developments in higher education curriculum in recent years. The cross-fertilization of theory with practice facilitated by relevant experiences in the field is a major step for general education. Since students and faculty are required to deal with the world as they find it and field experience rarely correlates well with narrow academic disciplines, interdisciplinary problem-solving is more the rule than the exception. Usually, however, single colleges or universities are quite limited in the amount of off-campus work they can adequately sponsor. Cooperation can extend the range of opportunities any one institution can offer. This cooperation need not be based upon legal contract in order to be beneficial to all institutions involved.

To call again upon the Union for Experimenting Colleges and Universities for an illustration, the Union's Off-Campus Programs provide one noteworthy model of how colleges can support each other's efforts to broaden the range of available educational experiences. Many institutions advertise their study abroad programs and similar activities widely, inviting students from other campuses to take part, but the experience for the visiting students, as valuable as it may be, tends to become a tangential one, unassimilated into the rest of his college program. By sponsoring cooperatively for its students eleven different types of extramural educational programs ranging from an urban field-study center in Chicago to an independent study and travel in Western Europe and the

Scandinavian countries, the Union creates the possibility for each of the consortium institutions to keep in touch with each of these curricula and thus better to assist their students in making their off-campus work a meaningful part of their total college experience.

The on-campus benefits to general education of interinstitutional cooperation depend to some extent upon the distance of the campuses from one another. Course exchange privileges, for example, not only make available a wider selection of courses, but bring about a social exchange between students from different campuses. This is especially effective in broadening social contact when the campuses differ markedly in sociological make-up.

The Service Function to Community, State and Federal Government

The grouping of institutional resources provides more impact on a service field where educational or research services are provided for the community of state or federal government. Coordination to avoid redundancy of services and to provide complementary resources where duplication is not needed are obvious benefits of cooperative efforts.

With society's growing realization of the need for action with respect to the urban crisis and environmental pollution, the colleges and universities will be called upon more to provide the knowledge base and personnel for an effective attack on these problems.

Organizations such as the Consortium for Area Planning and Development in Wisconsin provide a model for studying how this might be carried out. Established in 1967 under the sponsorship of Wisconsin State University at Stevens Point, the Consortium brought together 25 project leaders, local and state government officials, technical consultants and representatives of various institutions of higher education. In a seminar held in May 1968, three areas of concern for which Title I (Higher Education Act of 1965) funds might be secured were identified: (1) improvement of state and local governmental services, (2) urban problems with emphasis on the central city of Milwaukee, and (3) community and area resource development. The leadership of the consortium insists that the projects be learning experiences for all participants. "Therefore, major emphasis is being given to the development of academic resources for solving community problems through action programs."[14] Five objectives were identified for focusing the combined efforts of the group:

1. Improve coordination and cooperation of studies in area development.
2. Foster and improve inter-project and inter-community communication and dissemination.
3. Establish and maintain a clearinghouse and repository of information and other resources for area development programs.
4. Provide a foundation for a coordinated state-wide plan for area development.
5. Strengthen individual projects by avoiding unwarrented duplication of effort.[15]

WHAT IS "EFFICIENT" INTERINSTITUTIONAL COOPERATION?

We have seen in the preceding discussion some of the ways interinstitutional cooperation affects six broad functions of higher education. While it is difficult in many instances for educators to specify unambigously the nature of the product they wish to see derived from these functions, it is possible to specify more clearly some intermediate objectives which can be instrumental in moving toward the broader goals of higher education. It is in this context of intermediate objectives that an assesment of consortium effectiveness can profitably be considered.

In spite of the diverse types of consortia which are found among institutions of higher education, a limited number of consortium objectives seems to cover the purposes for cooperation. These objectives may be called "service objectives" in that, for the most part, they exist to aid the member institutions in fulfilling their own objectives better (i.e., more efficiently or more effectively). The following list is the result of an analysis of the programs of more than 50 consortia and discussions held with a number of the directors.

CONSORTIUM OBJECTIVES

Institutions of higher education cooperate in order

1. To decrease unit costs of major services such as libraries, computer centers, management information systems, and financial accounting; thus resulting in three alternatives:
    a. Retain level of resource allocation and increase service level, or
    b. Retain prior level of service and decrease level of resource allocation.
    c. Do not cooperate if consortium services do not result in lower unit costs.[16]
2. To increase the desirable academic opportunities available to the students at a minimum cost to the student and institution and at a level of quality consistent with prescribed standards of the institution.

The amount of increase in the opportunities is bounded by the limited resources of the students and the cooperating institutions, except in such cases where the efficiency of cooperation attracts additional support from foundation or federal sources. The alternatives posed by this objection when a given program is recommended are:

a. Participate if

   (1) The program is desirable and of high priority to students and the institution and

   (2) The program cannot be provided by the institution at lower cost to students and institution (all costs considered) or

b. Do not participate because one or both conditions above are not met.

3. To "develop" the faculty as a campus resource by improving the institutional bargaining posture in the academic market-place through

   a. Increased faculty benefits from cooperation (examples: credit union, pension plan, less expensive group insurance)

   b. Increased variety of teaching opportunities and opportunities to teach favorite specialities, or

   c. In-service inter-institutional seminars (some faculty are open to learning more) and departmental meetings.

The alternatives are too numerous to list here. The interfaculty seminars and informal communication can be limited by the distance between institutions, since the cost in time and transportation in confederations spread over more than 40-50 miles becomes a significan deterrent.

4. To increase the flow of funds to the institution through cooperative fund-raising and development seminars.

   More so than in any of the foregoing objectives, benefit forecasting is difficult. In this type of program the costs of participating for a period of time at least must be weighed against the difference in expected income from the program discounted according to the amount of uncertainty involved. The alternatives then are simply to participate or not to participate.

5. To lower unit costs and simultaneously raise the effectiveness of student recruitment, especially in selective programs such as minority recruitment.

   Cooperation results in higher visibility which aids in attracting the desired students. Centralized operations facilitate record keeping and coordination of efforts.

6. To improve institutional research efforts by

   a. Providing a continuous multi-institutional base for data gathering

   b. Lowering unit costs through centralizing data gathering activities

7. To enrich the cultural life of the campus through jointly sponsored lecture series, scientific and artistic exhibits.

8. To increase the quantity and quality of communication among consortium members and between these institutions and the broader educational community.

   Although this objective is inherently a part of cooperation in general and the foregoing objective in particular, it deserves to be listed separately because of its great importance and the emphasis that it has received from consortium administrators.

9. To provide maximum effectiveness in community and governmental service programs through coordination of resources.

THE OUTPUTS OF INTER-INSTITUTIONAL COOPERATION

The "service objectives" of consortia rather easily lend themselves to quantification. The following examples illustrate common identifiers of output flow with respect to the nine objectives just mentioned. These are all quantifiable and a number occur in the research literature on institutional cooperation.

Sharing Major Services

A Claremont Colleges study[17] is at present the only effort known in which the costs of various services at a consortium (Claremont Colleges) and at single institutions matched to the individual institutions of the consortium were compared. In this study seven areas are examined:

1. Library
2. Business Office
3. Health Service
4. Psychological Clinic and Counseling Center
5. Office of Institutional Research
6. Telephone Service
7. Maintenance and Repair

In two of the areas (Institutional Research and Telephone) the authors found that "virtually no information was available."

Service Outputs

Library: Volumes available per student
Books circulated per student
Hours library is open per year

Business Office: dollars handled

Health Services: doctor duty hours per student

Psychological Clinic: doctor duty hours per student

Maintenance and Repair: total square footage of college buildings maintained (figures were not available for the study but the authors believed this would have been the most useful indicator)

The conclusions which the authors of the Claremont Colleges study reached were largely the obvious ones. On the basis of the comparison of data from the colleges surveyed, they were able to support the argument that at least in the areas of library, business office, and health services the cooperation among cluster colleges is able to effect important cost benefits or economies as well as to increase the resources available to the small cooperative institutions. The authors found that in libraries unit costs do not continue to decrease with size, but contrarily, they take a significant leap upward for individual colleges as they grow beyond 1,000. This rise in unit costs appears to result from the addition of special collections, but it appears from cost data for the Claremont Colleges library that cooperation has helped to ameliorate this particular phenomenon by maintaining a relatively low cost per student ratio while serving a combined student body of more than 3,300 students.

The remaining identifiers of significant service outputs are also employable, but substantial research on the effect cooperation between colleges might have on the costs associated with these outputs (listed below) has not yet been done.

Curriculum Enrichment

Exchange of courses: number of cross registrations

Off-campus programs: number of programs available to students
number of student participants

Faculty seminars: changes in curriculum traceable to seminars

Faculty Development

Benefits: Credit union
Group insurance
Pension plan

Research: Research projects, papers written (this might be a bit forced, but it is the intended objective of the CORD program. See page 19 - 16).

Cooperative Fund Raising, Public Relations

Funds: new sources of grants and gifts
net increase in dollars raised

Student Recruitment

Special recruitment: number enrolled of particular type of student sought

Institutional Research

Projects: number of projects involved in

Innovation: number of program changes ascribed to institutional research studies

Funds: number and amount of grants secured

Cultural Enrichment

Number of events jointly sponsored

Communication

Inter-institutional: number of student-student contacts
number of faculty-faculty contacts
number of administrator-administrator contacts

Regional and National: number of personal contacts made by students, faculty, and administrators as as a result of consortium membership.

Community Service Projects

This service area requires more specifications (e.g., what are the project objectives?) in order to develop particular outputs. The efficiency of cooperation needs then to be examined in light of these special objectives-outputs.

These outputs just given are countable results from specific programs of cooperation. They may be used to answer such questions as, "Does cooperating give us the same service level for less investment of resources?" In some cases, quality is related to quantity but the correspondence is not on a one-for-one relationship. Qualitative evaluation of consortium programs like that of the programs of individual institutions requires information such as, "Are the right books available for the program?" rather than, "How many books are available?" The qualitative questions are much more difficult to answer.

As useful as the measurements suggested above might be, they cannot tell the whole story. In most cases they may serve as valuable indicators of program efficiency, but when plans are being made for a consortium or when programs are being evaluated, a number of factors relative to the nature of confederations as formal organizations comes into play, and these factors assume significant roles in the success or failure of the organization. In fact, it may be that one is at no time more aware of the imporatnce of the human organizational factors than when they, through being neglected, have brought about the failure of some grand design.

This in some measure was the case with an association of institutions of higher education in Arkansas known as the Arkansas Experiement in Teacher Education which, in spite of the statewide involvement of institutions of higher education and $3 million in underwriting from the Fund for the Advancement of Education, failed to reach the primary goal intended by its founders. Only a few of the highlights from the conclusions of the Report of Evaluation of the Arkansas Experiment in Teacher Education are given in the following paragraphs, but these will serve to underline the critical nature of such confederative requisites as the consonance of individual members' goals with that of the confederation, the satisfaction of both corporate and individual objectives and a tolerant social climate in which to function.[18]

The Arkansas Experiment in Teacher Education

The Report states that the Arkansas Experiment in Teacher Education (AETE) was an attempt to improve the training of teachers throughout the state of Arkansas by helping colleges to improve their undergraduate programs and by concentrating the professional training of teachers in a single year following four years of liberal-arts education.

The beginnings of AETE seem to spring from conversations between the President of the University of Arkansas and officials of the Fund for the Advancement of Education, and from these discussions in 1951 a planning grant of $85,000 was awarded the University to explore the feasibility of instituting a five-year teacher training program. (The State had at that time various two, three, and four-year credential patterns and was suffering from a shortage of classroom teachers.) Subsequent press accounts of the announcement of this grant and its intended objective carried the prediction that the ultimate scope of the study might involve all the colleges in the State and require ten years to implement completely. In addition, the expectation developed among interested parties that the Fund would support the intended "experiment" to the extent of $10 million.

Even before a viable organizational structure could be established, controversy developed over the objective of a five-year teacher education program, the dominant role which the university assumed in the planning phase, and the feeling that the Fund, having strongly and openly taken a stand in support of the five-year program, was "buying out" the colleges who were eager for the Fund's money but were not prepared to go along with the Fund's objective in the new teacher education program. The resistance at the campus level came largely from the Teacher Education departments who stood to lose their undergraduate curricular foothold (if not their job) if teacher education courses were postponed until the fifth or graduate year.

In this unfriendly environment cooperative planning of the project was begun by a group of representatives from the 15 participating institutions and other interested parties which became known as the "Committee of 36." The original intention of the Fund's representatives and of the administrators from the University was never realized. In the "Committee of 36" the fifth year idea was modified to a trial experimental program and the subsequent lack of enthusiasm by the faculty at many of the college campuses doomed the program from the very beginning.

In approaching the question of the success of the project, the authors considered both the effectiveness and the efficiency of the experiment. The authors defined organizational effectiveness as achieving organizational purposes; they defined organizational efficiency as distributing "enough rewards to its members to ensure their continued efforts toward these goals."[19] By these definitions, Spalding and Krathwohl conclude, the AETE was neither very effective or very efficient. The specific reasons for this conclusion which have been drawn from throughout the Report and listed here disclose that numerous critical conditions necessary for the success of the consortium were lacking in this case. Some of these reasons are presented in the following paragraphs.

Conflicting Purposes in Overlapping Memberships

The AETE "Committee of 36" was developed amid conflicting purposes held by various members of the consortium and by the funding agency. The compromise agreement contained a statement of two basic related purposes: the upgrading of undergraduate General Education and the establishment of a five-year teacher education program on an experimental basis. The former the colleges could accept readily and act upon; the latter, a watered-down version of the Fund's and the University's originally intended purpose, gained less support. This experience illustrated among other things that when over-lapping membership in different organizations presents a conflict of interests, people may tend to acquiesce to both sides in the conflict, but act only on their preferred program goal.

Administrative Problems

There is strong evidence that the early period of planning was dominated by a single individual, that goals were imposed from the top down, and that when the consortium "Committee of 36" was finally established it was too large to operate effectively as a single body. In addition, a a sizable bloc of members of the Committee were clearly opposed to the five-year teacher education program from the very beginning and remained so throughout the experiment.

Unfavorable Social Climate

The controversy surrounding the early announcement of the plans for a five-year teacher education program was quickly joined by the local press and by national professional education agencies; this created a climate of unfriendly dialecticism from the initial stages of the project.

Lack of Faculty Support

The five-year teacher education program lacked support of the undergraduate colleges faculties of teacher education because these faculties' programs were threatened with extinction if the professional education courses were all moved to the fifth year (therefore to graduate status and hence to graduate schools or University centers).

Dominant Member

At the beginning of the "experiment" the largest institution, the University of Arkansas, not only had initiated the project of the AETE, but let the impression exist that the University would ultimately administer the entire teacher education program for the State. Although this dominancy was somewhat diluted within the subsequent organization of the coordinating committee, the impact of the early role of the University appeared to persist.

Haphazard Program Planning

The student participation in the five year experimental teacher education program was grossly over-estimated. The projections, one president replied, were designed "to make the job appear big enough to get the money. Instead of first studying what the job was and seeing how much money it would cost to do it, they put down whatever number of students seemed to them to support the request which they wanted to make for money."[20]

Lack of Program Evaluation:

"The opportunities which AETE presented for careful study of the effectiveness of different methods of preparing teachers were never fully realized, largely because too many persons were so firmly convinced of the worth of one program or the other that they could not endorse collective evidence that might prove them wrong."[21]

The authors of the Report of Evaluation of the AETE conclude in their final chapter that:

> As far as the fifth-year goal is concerned, AETE was conceived in turmoil, born in compromise, and lived in relative indifference. If initial planning, prior to the grant of $85,000, had included all leaders who might have been affected by the proposal, highly charged emotions might not have been aroused. For knowledge of what is desired and opportunity to shape both ends and means often lead to harmonious action. But it is extremely doubtful that harmony and acceptance of the idea that all teachers should be prepared by a fifth-year program could ever have gone hand in hand. Assuming that this is possible also assumes that men will abandon cherished principles for a price, a practice which is universally condemned.[22]

The experience of the AETE has produced for consortium directors a vertible thesaurus of caveats. It has also demonstrated what every successful consortium director has already learned, that clearly stated consortium goals must have the prior acceptance of a large majority of the members at an early stage of the cooperative program before the planning and implementation of these plans can begin. The corollary of this, and perhaps the more difficult task, is that the consortium goal must complement the goals of the individual members; otherwise, even though the members may acquiesce to the adoption of a corporate goal that conflicts with individually held goals, they are unlikely to commit the necessary resources required of them for its success.

SUMMARY AND CONCLUSIONS

In the course of this paper we have looked at the purposes and patterns of voluntary cooperation in higher education with the thought in mind that it affords a strategy for more effectively and efficiently using the limited resources available to higher education. An effort has been made to list the many objectives towards which confederacies of colleges and universities in the United States have directed their combined resources and with this we have suggested outputs which might be examined as a means for determining the effectiveness and the efficiency of a consortium program. The experience of the AETE reminds us that those involved in a prospective program must necessarily be closely tied to the planning stages and that no amount of money is likely to change basic value commitments. These factors and others which may be implied from this experience are primary considerations in establishing effective cooperation among education institutions.

Once the inter-organizational climate has been sufficiently stabilized and a consensus has been reached on goals which are harmonious with the goals of the individual members, then the plans and their implementation may proceed. It is difficult to conceive of success even at this point without some substantial feedback on the accomplishment of the operations which program evaluation provides. This expectation was voiced by Professor Edward F. Sheffield of the University of Toronto in a paper on Canadian Research in Higher Education:

> When an association concerned with higher education develops to the point where it has its own secretariat, some research activity may be expected. The Association of Univeristies and Colleges of Canada is one of the examples I know best. It acquired a secretariat in 1957 and a research officer in 1958. Thus for eleven years there has been a nucleus of research work.[23]

With the exception of the C. O. C. Consortium (of Chicago and the Big Ten universities) which has a secretariat, we have found this not to be the case in the consortia studied in the United States. Even in those cooperative ventures which have more than a few years of experience little effort has been turned to an analysis of effectiveness. One is tempted to suspect that the reason for this lack of evaluation may be quite similar to that which the authors of the AETE Report gave (see page 19 - 32), that a cooperative program, because of the delicate nature of cooperation between institutions, might better be left unexamined no matter what its quality than risk, through the admission of failure of one program the forfeiture of all future cooperation.

Whatever the reason may be, there is at the present time a paucity of information on the effectiveness of the cooperative programs. This is true despite the substantial amount of resources devoted by institutions of higher education each year to continuing consortium programs. Although the increasing numbers of cooperative arrangements continue to enjoy a climate of faith in their reasons for existing, we are forced to admit that we really do not know with any degree of certainty how well the job is getting done. Despite the fact that we recognize that our tools of evaluation of educational programs are not infallible and that the objectives of the programs are too often unclearly stated, the real need at this point in the history of interinstitutional cooperation is for an administrative commitment to the hard task of program evaluation so that reliable information (as reliable as possible) on the effectiveness of their programs may be supplied to those who must furnish the resources for higher education.

NOTES

[1] For a brief discussion of this phenomenon and the source of this present observation see Burton R. Clark, "Interorganizational Patterns in Education," Administrative Science Quarterly, Vol. 10, No. 2. (September, 1965), pp. 224-237.

[2] Ibid., pp. 234-237.

[3] Raymond S. Moore, Consortium in American Higher Education: 1965, Report of an Exploratory Study (Washington, D. C.: Office of Education, 1968), p. 4.

[4] Raymond S. Moore, "Cooperation in Higher Education," Interinstitutional Cooperation in Higher Education: Proceedings of the Conference on Interinstitutional Cooperation in Higher Education, ed. by Lawrence C. Howard, (Milwaukee, Wisconsin: Institute of Human Relations, University of Wisconsin, 1967), pp. 304-324.

[5] Lewis D. Patterson, ed., Directory of Academic Cooperation Arrangements in Higher Education (Kansas City, Mo.; Kansas City Regional Council for Higher Education, Nov. 1, 1970), p. 1.

[6] Jerry G. Gaff et. al, The Cluster College (San Francisco: Jossey-Bass Inc., Publishers, 1970).

[7] H. R. Kells, The Cluster College Concepts: A Conference Schedule and Reference Book of Contributed Materials (Claremont, California: Office of Institutional Research, The Claremont Colleges, 1967), p. 4.

[8] Richard E. Langford, "Bethune-Cookman College and Stetson University: A Cooperative Course," in Expanding Opportunities: Case Studies of Institutional Cooperation (Atlanta: Southern Regional Education Board, 1969), p.5.

[9] Report of the Five College Long Range Planning Committee, Five College Cooperation: Directions for the Future (Amherst: The University of Massachusetts Press, 1969), p. 7.

[10] The Engineering Advisory Council, An Engineering Master Plan Study for the University of California (Berkeley: University of California, 1965), p. 9.

[11] A Consortium Report: Faculty Research (Corning, New York: College Center of the Finger Lakes, 1969), pp. 5-16.

[12] Faculty Handbook (Chicago: Associated Colleges of the Midwest, 1960), p. 8.

[13] Inter-university Consortium for Political Research, Biennial Report 1966-1968 (Ann Arbor, I. C. P. R., 1969), pp. 3-4.

[14] Research in Education, Document Resume ED 029 594 (Washington, D. C.: Office of Education).

[15] Robert C. Clark and Karen Manthe, Wisconsin Area Planning and Development Consortium Project; Title I, Higher Education Act 1965, Seminar Proceedings No. 1. (Stevens Point, Wisconsin: Wisconsin Area Planning and Development Consortium Committee, Wisconsin State University, 1968), p. 2.

[16] It is important to emphasize that in contrast to many situations within statutory systems, noncooperation is invariably an option on a program-by-program basis in multi-program, voluntary consortia. Of course, in a single purpose consortium, the institution has the option of not joining.

[17] Clifford T. Stewart and John W. Harley, Financial Aspects of Inter-institutional Cooperation: Unit Costs in Cluster and Non-Cluster Colleges (Claremont, California: The Claremont Colleges, June, 1968).

[18] William B. Spalding and David R. Krathwohl, A Report of Evaluation of the Arkansas Experiment in Teacher Education, (Mimeographed.)

[19] Ibid., p. 178.

[20] Ibid., pp. 164, 166.

[21] Ibid., p. 156.

[22] Ibid., p. 177.

[23] From an unpublished paper of Professor Edward F. Sheffield; read to the Association of Quebec University Professors of Education at McGill University, Montreal, September 26, 1969.

CHAPTER 20

COOPERATIVE EDUCATION IN COLLEGES AND UNIVERSITIES

INTRODUCTION

In response to the increasing educational opportunities which modern mass transportation and communication make available, colleges and universities are looking beyond the campus boundaries for adjunct learning experiences which support and extend the student's on-campus learning. In most cases these off-campus programs are neither particularly innovative nor experimental: study abroad, field study, internships and various other types of extramural learning often have a long if not extensive history. The noteworthy fact today is the extent to which some students are spending their time in college-sponsored off-campus projects.

Cooperative education is one of the strategies educators have employed for increasing the guided educational experiences of the student with the "outside world." Cooperative education provides for alternating periods of study and work (field experience) integrated where possible so that the student's field work supports his academic studies. Often called "work study," the term "cooperative education" is now generally reserved by educators for college-level programs while work-study is more often reserved for the secondary level vocational curricula.

The present cooperative education programs owe their historical precedence to an engineering work-study program inaugurated at the University of Cincinnati in 1906 under the leadership of the late Herman Schneider.

Professor Schneider's observation that engineering students could benefit from the opportunity to apply in real-life situations the knowledge and skills learned in the classroom led to the successful development of an alternating schedule of academic work and job experience which has been adopted in principle not only by many schools of engineering but by a wide variety of academic disciplines and on virtually every level of education.

HOW WIDESPREAD IS COOPERATIVE EDUCATION?

At the present time there is no single comprehensive measure of the extent to which cooperative education or mutations of the work-study curriculum have been employed in education. Several studies within the past decade, however, indicate that the principle of cooperative education is spreading both among the various levels of education and throughout the many disciplines in secondary and higher education, but a comparison of the lists of institutions covered in the studies concerned with community colleges, liberal arts colleges, and universities leads to the conclusion that none of these studies or lists is exhaustive in its coverage of cooperative education programs.

The earliest of these studies, and to this date the most thorough analysis of the effectiveness of college programs of alternating work and study, is reported in the book, Work-Study College Programs: Appraisal and Report of the Study of Cooperative Education authored by James W. Wilson and Edward H. Lyons.[1] In the course of that project, which was inaugurated in the summer of 1958, the authors found that a total of sixty-one institutions awarding the Baccalaureate degree followed an educational plan which integrated classroom experiences with practical work experience. An analysis of the study and the conclusions of the project committee will be given some detailed attention in succeeding pages of this chapter.

As a result of findings of the Wilson-Lyons study the National Commission for Cooperative Education was formed "with the goal of doubling the opportunities for students to enroll in college and university programs on the 'work-study' plan."[2] From the statistics published in the Directory of Cooperative Education (March 1970) one can safely conclude that the Commission has been eminently successful. Since the Commission's beginnings in 1962, 108 new programs have been added to the 70 existing ones which had been established over a period of 56 years. At this time at least 178 institutions offer cooperative education.[3]

A survey of cooperative education conducted in 1969 by a joint committee of the Cooperative Education Association and the Cooperative Education Division of the American Society for Engineering Education found at that time 143 cooperative work-study programs in junior colleges, colleges and universities. A useable response of 66.9 percent was received in the survey of these institutions. Only those results concerned with the extent and size of the programs are summarized here.

1. Nearly half of the 85 institutions which responded began their cooperative education since 1960.
2. The size of programs varied greatly from 4 to 9,370 with a median of 132 for Baccalaureate colleges and 147 for community colleges.

3. Fifty-five percent of the programs reporting were one-man (administrator-coordinator) programs; an undetermined portion of these were less than full-time.

4. Coordinators, whose principle function is interviewing students and making the arrangements for the off-campus work experience are reported to carry student loads ranging from 5 to 613 "placed" students. It is not clear from the data reported what an average full-time coordinator's load might be. Part-time coordinator loads are not differentiated from full-time loads, hence the meaning of the various medians is obscured.[4]

Cooperative education has proved to be a very useful and effective means of conducting vocational education, especially among those groups of students currently described as disadvantaged. In a survey of existing cooperative job-oriented education programs in 1969, 64 such programs were identified. Data secured on 95 percent of these programs indicated that the majority of the participating educational institutions were secondary schools; the extent to which community colleges and universities were involved in work-study curricula for the disadvantaged was nevertheless noteworthy.

Level of Educational Institutions Involved in Cooperative Education Programs for the Disadvantaged[5]

Elementary	4%
Secondary	53%
Junior College	5%
University	8%
Post-Secondary	12%
Adult Basic Education	18%

In the study of job-oriented cooperative education programs by Trudy W. Banta and Douglas C. Towne, from which the statistics above were taken, the authors list federally-supported job training programs through which aid to cooperative education is channeled.[6] It is interesting to note in information provided elsewhere in the study that federal funds support a relatively small proportion of the number of programs surveyed by Banta and Towne. Fifty percent of the work-study programs are supported entirely by industry. Sixteen percent are supported entirely by schools. Only in nine percent of the programs do federal funds pay for the entire support. The remaining twenty-five percent are financed by a combination of federal and institutional resources.[7]

There is additional information in this report which indicates a substantial interest on the part of industry in promoting cooperative education. From the respondents to their survey, Banta and Towne found that fifty percent of the programs were initiated by industry. Twenty-five percent were initiated by the schools and twenty percent by committees composed of members from both industry and the schools. In the remaining five percent of the cases civic groups were the motivating force for establishing the programs.

A special case has been made for the appropriateness of cooperative education to the mission of the community college.[8] With the growth of this level of education the number of alternating work-study programs can be expected to increase. Guidelines to be followed in establishing these programs will be published early in 1971 through the efforts of the Work Experience Advisory Committee of the American Association of

Junior Colleges.[9] There does not now seem to be an adequate census of the extent that work-study practices have been adopted by community colleges, but it seems reasonable to assume that the trend toward removing the barriers between academic experiences and practical application will continue on the two-year college campus and will result in the formation of many more cooperative education curricula.[10]

WHAT IS THE "ESSENCE" OF COOPERATIVE EDUCATION?

At the outset of the Wilson-Lyons study of cooperative education an operational definition of cooperative education was developed.

> The cooperative plan of education is defined as that educational plan which integrates classroom experience and practical work experiences in industrial, business, government, or service-type work situations. The work experience constitutes a regular and essential element in the educative process and some minimum amount of work experience (at least two different periods of work, totaling at least 16 weeks) and minimum standards of performance are included in the requirements of the institution for a degree. In addition there must be a liaison between administration of the institution and the employing firm. The essential criteria, as used in this study, are that the work experience be considered an integral part of the educational process, and that the institution take a definite responsibility for this integration.[11]

The authors carefully point out that the definition is less restrictive than a former one employed by Henry H. Armsby.[12] The emphasis in the Wilson-Lyons definition is placed upon planned, integrated (classroom experience with work), required minimum (at least two different periods totaling at least 16 weeks) cooperative (emphasizing the school-industry relationship) work (not necessarily reimbursed by "employer").

Armsby would add more: alternation between classroom and work, payment for employment, strict relationship between student's field of study and work, and job advancement through progressively more difficult tasks.[13] The criteria of planned, integrated, required minimum, cooperative work are not quite universally adopted by institutions claiming to have cooperative education and they are not altogether free of ambiguities, but they carry a great deal of the essence of cooperative education within themselves and a closer look at the meaning of these criteria is warranted.

Planned: The intended impact of this criterion is to emphasize the concurrence between the student's combined academic and vocational goals and the learning which is achieved in the work situation. One community college requires the student to draw up a proposed program of work-study and indicate how this may be instrumental in achieving his objectives. Periodic review and evaluation of the student's program should be accomplished together by the student and his advisor for optimum fulfillment of the intent of this criterion.

Integrated: This criterion harks back to one of two observations of Professor Herman Schneider upon which he founded cooperative education.

> Every profession...has many facets which cannot be taught in the classroom. These facets can be learned only through direct on-the-job experience with professionals already successful in the field. [14]

The ideal implementation of this criterion would occur if Professor X were to plan his classroom curriculum in conference with employer Y with the objectives of student Z in mind. To this end the recommendation that cooperative education coordinators also teach part-time (or vice versa, that teachers also coordinate part-time) has been made. The infeasibility of such close coordination for any substantial number of students is readily obvious. But perhaps, more to the point is the fact that (1) the ideal integration imputes more flexibility to the classroom curriculum and the industrial (or other) work situation than they can ever be expected to possess even if X and Y were to confer and (2) there is an even more basic difficulty to be resolved in instances where the student's career plans are nonsequential to his academic major (e.g., the history major who wants to become a sports writer).

Required Minimum: This criterion emphasizes an institutional or departmental commitment to the universal value of cooperative work experience for its students. There seems to be a tendency on the part of colleges and universities not to make cooperative education required. In a 1969 survey of cooperative education Wilson found that 68 percent of the institutions surveyed "indicated their cooperative programs are optional in all curricula." In those institutions in which optional programs exist Wilson also found that a sizeable majority of the institutions (59 percent) "indicated students must apply to the cooperative department and are accepted or rejected according to established criteria."[15]

Cooperative: The emphasis upon university-industry communication concerning the student's education is one of the more idiosyncratic features of cooperative education. It is a means of securing an education for the student which can build upon the strengths of combined institutions, providing either more relevant opportunities or a broader range of opportunities or both. The improvement in mutual understanding which can result between the university and its larger community in this educational partnership is an important by-product and is not overlooked by the cooperative institutions on either side of the campus wall.

Work: Wilson's definitive statement on the place and meaning of "work" in the cooperative work-study program identifies this activity as "goal directed activity, the object of which is to fulfill some need of the person performing the activity and which is directed toward production or service."[16] The word is further differentiated from such classroom oriented activities as "homework," "work in the library," and "work on papers" by labeling the activity which takes place in work periods of the cooperative education routine, nonscholastic. "Work" in this context is usually, but not necessarily, compensated; hence, employment is not a satisfactory synonym.[17]

The integration of "non-scholastic goal directed activity" and academic curricula is the heart of cooperative education. As Wilson concludes "its essence is the introduction of student non-scholastic work into the educational program; chief among its properties is student growth and development; the accidents (i.e., non-essential properties) are specific means of implementation, e.g., alternating or field periods, employment or service work, professionally directed work or generally educating work; mandatory, elective, or selective programs."[18]

HOW EFFECTIVE IS COOPERATIVE EDUCATION?

If cooperative education involves an incursion of non-scholastic goal directed activity upon the more traditional academic curriculum, then it is only fair to ask, what are the goals toward which cooperative education is directed and how effective is this activity in achieving these goals? These questions were the focus of the comprehensive appraisal of college work-study programs which Wilson and Lyons completed in 1961. Briefly, these are the findings of this research.

A Comprehensive Study of Cooperative Education

The appraisal of cooperative education in the United States directed by James W. Wilson and Edward H. Lyons was organized to examine the claims and criticisms of college programs of work-study. From various sources (college literature on cooperative education, correspondence and interviews) the researchers gathered the following list of claims and criticism.*

Claimed Educational Consequences

1. "Introducing work experience into the student's curriculum provides him additional and meaningful opportunities to apply the principles, concepts, and theories learned in the classroom to real and concrete situations." (16)[19]
2. As occupational preparation, "it is claimed that the cooperative plan serves to orient the student to the world of work and aids him to develop a sense of reality about work." (17)

Claimed Economic Values to the Student

1. "The cooperative system makes higher education financially feasible for many able young people who might otherwise be denied a college education."
2. "The cooperative student has many more opportunities for developing placement contacts."

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*Numbers in parentheses throughout this review refer to the page on which the particular information may be found in the published Report.

3. "Upon graduation he has a head start with respect to responsibility and salary." (17)

Claimed Consequences for the Institution

1. More students can be accomodated in a given set of facilities through the cooperative system because the facilities are used year around.
2. "The faculty is kept in touch with industrial and business needs and developments." (17)

Claimed Outcomes for Business and Industry

1. The cooperative system provides a flow of trained personnel and provides a testing ground that enables industry to select students of greatest promise for permanent employment. (18)

Claimed Values for Society

1. Cooperative education attracts to college some talented students who would otherwise not attend--students from the lower economic levels with families which have no tradition of higher education.

Main Criticisms Examined

1. Students tend to become "reality bound" because of too early an introduction of practical work into an intellectual development process. (16)
2. The interruptions of the academic work by the alternation between school and work cause loss of educational effectiveness. (16-17)
3. Student development is curtailed because of the difficulty of participating in the campus life when the student periodically leaves the campus for work. (16-17)
4. "The administration of a cooperative program is more difficult and more costly than traditional programs." (18)

5. A recession in the national economy seriously affects cooperative placements. (18)

6. From industry's point of view training costs are high and continuity of work is broken because of the alternating periods of study. (18)

Out of a group of sixty-one Baccalaureate granting institutions offering cooperative education in 1959, seventeen institutions with a total of twenty-two cooperative programs were selected by Wilson and Lyon to comprise the cooperative sample. Ten similar institutions without cooperative programs were selected for comparative purposes. In order to confine the study within manageable bonds, only the liberal arts, business administration, and engineering curricula were used for the study. The necessity for such a restricted selection is understandable; nevertheless, it is unfortunate that, in view of the rather idiosyncratic results found among these three diciplines, a wider variety of program types was not included.

The institutional and student characteristics of the sample group were investigated in some detail. It is remarkable to find that all the liberal arts colleges, both cooperative and non-cooperative, were small colleges located in rural settings; the institutions containing the business administration and engineering programs were larger (2,500 and above) and located in urban areas. The location of the liberal arts colleges is remarkable for two reasons. First, Armsby had categorically stated in 1954 that a rural setting was inhospitable to cooperative programs.

> The Cooperative institutions do not contend that their plan should be adopted by all schools, or even by all colleges of engineering,

> or that it will fit all industries. Indeed, it is generally agreed that no institution should even experiement with the system unless it is located in an urban or industrial community, or unless abundant opportunity for cooperative employment is otherwise available.[20]

Secondly, it would seem likely that the special characteristics of the rural campus or at least the students who attend them should tend to confuse the information gained from a comparison of student characteristics among disciplines.[21]

The press of the campus environment were examined to determine whether or not cooperative colleges differed in any significant way from the non-cooperative colleges. Among the most noteworthy generalizations from the data are the conclusions that:

1. There is greater contrast in campus press among the three curricula than there is between cooperative and non-cooperative campuses.
2. There is no single characteristic setting for cooperative education. (40)

The characteristics of the students in both cooperative and non-cooperative institutions were examined with respect to four areas: social class, intellectual potentiality, psychological needs, and ordering of educational goals. The researchers found that a statistically significantly larger number of non-cooperative students come from the upper and upper middle income families and a significantly larger number of cooperative students come from lower income families (41).

These findings seem to buttress a very important claim of cooperative education proponents that cooperative education provides greater access to higher education than the more traditional patterns. The authors point to two reasons why this seems true: 1) the financial barrier is to a large extent surmounted for the poorer student since he is able to earn a considerable proportion of the money required for school expenses, and 2) academic experience which is related to work often seems to make more sense to the families with low income (43).

In academic potentiality Wilson and Lyon found generally no significant difference between cooperative students and non-cooperative students. The high school grade point averages, the College Entrance Examination Board Tests (CEEB), and the American Council on Education Psychological Examination (ACE) scores were used for comparative purposes. Only in the verbal scores on the CEEB was a statistically significant difference found between any cooperative and non-cooperative groups. In this section of the test the non-cooperative engineers scored considerably higher (Medians: 69th percentile vs. 47th percentile) than the cooperative engineers. (46)

The general conclusion is that cooperative students do not differ substantially from the non-cooperative in academic potentiality, refuting a claim by some critics that cooperative education typically selects students who are intellectually inferior to non-cooperative students.

Students were asked to rank in the order of their importance six possible goals of higher education. There was strong agreement among all groups on the priorities of these goals except for the ranking of vocational training and basic general education. Both the cooperative and non-cooperative liberal arts students placed basic general education as the first goal of education, both groups of engineering students placed vocational training first, while the cooperative and non-cooperative business administration split, the former selecting general education, the latter selecting vocational education as the first goal of higher education. The students were then asked to indicate the extent to which they were finding opportunities to achieve the goal which they believed to be most important. As in many other situations in the study there was no significant difference between cooperative and non-cooperative students, although the three discipline areas revealed statistically significant differences among the different curricula. (64) The conclusion reached by the authors is that "in most respects cooperative students are like their non-cooperative counterparts."

The faculty and industrial personnel involved in cooperative programs were asked to express themselves on the values of cooperative education. While the comments tended to parallel the claims for cooperative education stated early in the study, several important conclusions may be drawn from this section of the research.

1. Two distinct views of cooperative education appear to be held, the one by members of professional programs and the other by members of liberal arts programs. The former see work experience as "an opportunity for the student to reinforce his classroom learning and to develop other skills, understanding, and attitudes which will assist him in becoming an effective 'professional man' and citizen." (69) The latter "appear to view cooperative employment more as general education experience." (69)
2. Employing firms reported strongly positive values for their companies from involvement in cooperative programs. Such programs provided them with a more effective and efficient recruiting

program, with student personnel who could assist in semiprofessional duties releasing professional staff for work more in keeping with their talents, and in addition, gave to the company a sense of making a contribution to the community. (70)

3. The faculty in this survey, many of whom had experience teaching both in cooperative programs and non-cooperative programs reacted to four claimed outcomes in the following manner.
    a. Cooperative work experience develops student motivation for their academic work.

       Reaction: Positive

       52.1 percent clearly agree

       16.6 percent tend to agree
    b. Cooperative work experience aids the student in developing greater skill in applying theory to practice.

       Reaction: Positive

       42.3 percent strongly agree

       30.7 percent tend to agree
    c. Cooperative work experience overemphasizes the value of the practical, creating "reality-bound" students.

       Reaction: Negative

       41.7 percent strongly disagree

       21.5 percent tend to disagree
    d. Cooperative work experience interrupts the orderly presentation of academic work, resulting in over-all academic loss.

Reaction: Negative

67.5 percent clearly disagree

7.4 percent tend to disagree

The conclusions drawn from these statistics and from other information associated with this part of the research are strongly supportive of cooperative education and the positive claims for motivation and the increase in student ability to apply theory to concrete situations are confirmed. (86)

The cooperative student was studied to see how he functions within an academic setting. In connection with the theory to practice claim the students were asked if their opportunities to practice applying theory to practical situations were adequate. The statistics indicate that a significant "larger proportion of cooperative students and graduates than non-cooperative students and graduates felt their opportunities to practice applying theory to concrete situations were adequate" (90).

A variety of questions were constructed to gather further information on student motivation by examining: (1) their interest in and satisfaction from courses within and outside their field of concentration, (2) the amount of unassigned reading done, (3) the hours spent in out of class study, and (4) plans for graduate study.

Small but statistically significant differences were found in two areas. The results indicated that cooperative business administration and engineering students were somewhat less satisfied with courses in their major, and fewer cooperative students than non-cooperative students reported having withdrawn no books from the library during the previous month.

Since the rest of the data indicated in general that the academic behavior of cooperative students is not significantly different from that of non-cooperative students and further, that the participation of cooperative students in extracurricular life was not different from that of non-cooperative students, the conclusion one reaches from this section of the report is that not only do cooperative students possess similar academic potential to non-cooperative students but they behave essentially the same in an academic situation. In view of the faculty observations regarding the motivational benefits of cooperative education, one might be inclined to say that the cooperative student is likely to be more highly motivated to do academic work, but the evidence is not conclusive in this matter.

Graduate students were asked to reflect upon their college experiences. They were asked among other things the relationship of their academic major to their first job, their satisfaction with their first job, and the amount of their first salaries. They were also asked why they selected their alma mater.

There was no significant difference between cooperative and non-cooperative students in the groups which reported that they were able to apply much (or some) knowledge and skill gained from school in their first job. Nor was there any significant difference between groups in the number which found their first job satisfying. (110) Both the graduates from cooperative and non-cooperative programs stayed on their first job about the same length of time. Above the $4,000 income level "there is a tendency, with the exception of liberal arts graduates, for a somewhat greater proportion of cooperative than non-cooperative graduates to have earned this much on their first job after college." (111)

Seventy-eight percent of the cooperative graduates indicated that they had selected their alma mater because of the cooperative education program. Forty-one percent of the cooperative graduates stated that economic reasons were a factor in their selection of their institution. Only 29 percent of the non-cooperative graduates gave this as a reason. (119)

Fewer cooperative graduates than non-cooperative graduates reported being fully satisfied with their alma mater (225); however, those stating that they were actually dissatisfied show less difference (225).

Extent of Dissatisfaction with Alma Mater

Interview Respondents

	Liberal Arts		Engineering		Business	
	Coop	NC	Coop	NC	Coop	NC
N=	43	52	139	144	53	55
Dissatisfied	2.3%	1.9%	5.0%	1.4%	5.7%	5.4%

The study detailed the reasons for these dissatisfactions. Several reasons were noteworthy and bear listing.

> A larger proportion of cooperative (26 percent) than non-cooperative (12 percent) graduates felt need for more or better general education. ...Cooperative liberal arts (27 percent) and business (23 percent) graduates more frequently than their non-cooperative counterparts (L. A., 13 percent; Bus., 9 percent) expressed a desire for more or better practical work experience. Finally, a larger proportion of engineering (24 percent) and business (21 percent) graduates than liberal arts (7 percent) graduates expressed need for more personal attention and supervision. (121)

There is an effort by administrators of cooperative education to minimize the financial benefits to the student lest he emphasize earnings to the detriment of the educational benefits of the program. Wilson and

Lyons report that "virtually every coordinator in the sample cited as a pressing problem the overemphisis by students on the financial rewards of cooperative employment." (151) The income from employment is nevertheless one of the most important benefits for the student from a poor family; thus the question cannot be ignored when the benefits of cooperative education are examined.

The study found that approximately 50 percent of the cooperative students earned 70 percent or more of their total educational costs, whereas the same proportion of non-cooperative students earned only about 20 percent of their expenses (123). The range of earnings varied greatly with the curriculum of the student (from $1,500 for a liberal arts student to $7,300 for a five-year engineering student) (122). The authors conclude, nevertheless, that this feature of cooperative education is substantial enough to warrent listing as one of ten final conclusions to their study.

> Because of the financial remuneration received by students for their cooperative work, the cooperative plan makes higher education feasible for many talented youth who might otherwise find college prohibititely expensive (157).

The argument is appealing but it does not take into account other alternatives for making higher education financially feasible for the low income student. It will be shown later that under some work-study arrangements, an educational loan may actually be less costly for the student.

One of the claimed consequences of cooperative education for the institution is that the campus facilities may be used more efficiently. It is claimed that since the ideal program of cooperative education alternates between classes and work, it should be possible to serve two complete student bodies with the same facilities by having one at work while the other is on campus. Operating on a year-round basis, the students spend equal amounts of time on campus and off campus and complete the normal Baccalaureate program in five years.

Such a model is contrasted with the traditional non-cooperative program of a four-year Baccalaureate program in chapter nine of the Wilson-Lyon book. (138f)[22] Three patterns of cooperative education are compared to the four-year model. The most productive pattern (productive in terms of the number of graduates turned out) of cooperative education required that work experience begin during the freshman year, that two equal-sized student bodies alternate on campus during the year, and that the normal degree program take the student five years.

On this basis the output of graduates could ultimately be 60 percent greater than the output under the traditional four-year degree program using comparable facilities for only nine months of the year (141). Other patterns discussed achieved less remarkable increases in the efficiency of the physical facilities.

The capstone of the Report is a chapter summarizing the conclusions of the study. These are condensed and presented below in table format along with observations by this author.

Wilson-Lyons Conclusions	Observation
1. The academic potential of cooperative students is equal to that of non-cooperative students.	It would be possible from the data on grade point averages presented in the study (46) to demonstrate that the non-cooperative students were slightly superior. The difference is not dramatic, although it is statistically reliable in several instances.
2. The cooperative experience provides meaningful opportunities for the student to see the relevance of theory to practical situations and affords him opportunities to practice making applications.	This conclusion is corroborated by 73 percent of the faculty surveyed, by industrial respondents and by the students themselves.
3. Cooperative education makes a positive contribution to society by attracting able young people to college who might otherwise never consider continuing their education beyond high school.	The authors substantiate this conclusion by pointing to the fact that a substantially larger proportion of cooperative students and graduates come from families with low income.

Wilson-Lyons Conclusions	Observation
4. Business and industry are enthusiastic about cooperative education	This appears to be substantiated by the reported responses from business and industry. The effect of an economic recession upon this enthusiasm was not discussed.
5. Because of the financial remuneration received by students for their cooperative work, the cooperative plan makes higher education feasible for many talented youth who might otherwise find college prohibitive.	This is another way of stating the third conclusion, emphasizing the economic factor. It appears to be justified for the same reasons as the third conclusion.
6. Students are able and do enter into the life of the college as effectively as non-cooperative students.	This conclusion is based upon ample but mixed evidence. Although the results in general would support this conclusion, the record of liberal arts cooperative students stands out in sharp contrast. The following proportion of affirmative responses was obtained when students were asked whether or not they belonged to a campus organization such as glee club, student government, etc.

Wilson-Lyons Conclusions	Observation

	Coop Freshmen	Non-Coop Freshmen
Yes:	37.0%	75.7%
No, but I hope to join	29.0%	12.9%
No, and I don't plan to join	28.0%	7.1%

	Coop Seniors	Non-Coop Seniors
Yes:	48.6%	69.1%
No, but I hope to join	1.4%	1.8%
No, and I don't plan to join	45.7%	29.1%

Wilson-Lyons Conclusions	Observation
7. The five years of college required by most cooperative programs is viewed by more than 85 percent of students and graduates as no handicap in getting started in a career.	This is well substantiated by the evidence.
8. Alternating between work and classroom is not a serious educational problem. Some faculty members believe that actual advantages accrue from this.	

Wilson-Lyons Conclusions	Observation
9. The cooperative plan is demonstrated to make possible more effective utilization of college facilities.	In a limited consideration of the total number of graduates which can be educated in a given set of facilities, it is demonstrated that these facilities can accomodate up to 60 percent more by employing an alternating work-study schedule and a year-round calendar. Whether or not the total cooperative program, with all costs and benefits considered, is more cost-effective than the traditional four-year program has yet to be considered.
10. The data clearly indicate that the vast majority of cooperative students and graduates felt their original hopes and expectation for selecting cooperative education were realized.	

The authors of this study clearly arrive at a series of conclusions upon which the value of cooperative education may be equated with that of the more traditional pattern of higher education. But here the pithy comment of William J. McGothlin is apropos:

> It seems to me that the data on academic results support the conclusion that students do not lose as much by following a "cooperative" program as some have feared; but it does not seem to me that the data support the conclusion that "cooperative" students achieve a great deal more than they would have done under continuous academic work. There is a world of difference between these two conclusions.[23]

The point is a critical one especially in light of one of the criticisms of cooperative education acknowledged in the Wilson-Lyons Report. This criticism stated that "the administration of a cooperative program is more difficult and more costly than traditional programs." (18) This criticism is not answered in the Report and consequently we must assume for the moment that it stands as a valid judgment. The questions remaining then are how much additional difficulty and cost is inherent in cooperative education programs and can this additonal cost be justified. This author believes there are data available to answer this tentatively but that further research of a quality comparable to that just discussed is warranted for clearer guidelines as to which curricula are most cost-effective.

THE COSTS OF COOPERATIVE EDUCATION

A partial picture of the costs of a cooperative education program can be realized by examining the scattered information found in various publications. Since each party in cooperative education, the university, the student, and the employer, is concerned with what his costs might be, we shall discuss each separately. One should keep in mind that certain costs, for example the cost of on-the-job-training, the cost of supervision, the cost of the fifth year of education, may be borne by one party or another, depending upon the nature of the agreement between parties at the outset of the program; consequently, a single formula for stating the costs of each party is not possible.

To illustrate, the training of a new entrant to the program is an expensive operation in some work situations for there may be a prolonged period of time during which the company must invest resources in the student's training with little or no compensating productivity on the student's part. Generally the company is willing to make this investment and still pay the student his wages during this period since it is reasonable for the company to expect to recoup at least a major portion of these expenses as the student becomes more productive on the job. But in situations where this expectation of return on the investment is not reasonably held, for whatever reason, the parties involved might very well consider sharing the cost of training.

How an institution decides what an equitable tuition is in view of its required five-year Baccalaureate program is likewise a problem with several alternative solutions. During the same year, 1968, two private institutions, both of which were on an alternating work-study calendar with the majority of their students, charged annual tuitions of $1,000 and $1,650. The difference in income from a student attending five years is $3,250, a cost which the former institution (the one charging $1,000 tuition) bore for the student.

There is such a diversity of practices and sizes of institutional programs that single examples and averages of tuition charges, administrative costs of student income can be misleading. For this reason the analysis which follows must serve primarily to raise pertinent questions in terms of which specific cases might be examined.

The Costs to the Institution

There are conflicting claims regarding the cost effectiveness of cooperative education. One claim is that institutional efficiency is enhanced by employing a year-round calendar in which students alternate between on-campus activities and off-campus work. The second claim points to the additional administrative and clerical staff required for such a program and emphasizes the increased financial burden which this entails.

Some facts can help clarify this apparent quandry. Edwin D. Harrison has demonstrated that an efficient cooperative education program alternating two full-time student bodies between work and campus activities can ultimately achieve a 60 per cent increase in graduate output over a traditional nine-month college program.[24] This estimate considers mainly the question of space utilization, a significant matter to be sure, but only a part of the financial picture of operating a college or university. Let us look at a model of a medium-sized institution and see if the effect of a year-round, alternating work-study program on the operations budget can be approximated.

For a base of comparison we shall use a traditional four-year college with a nine-month calendar divided into three terms (three quarters). This particular college is fairly affluent; it possesses a campus valued at $42 million and raises an annual educational operating budget of $18 million. The campus serves a full-time student population of 5,000 undergraduates, each of whom pays $2,300 a year for tuition and fees.

We shall further assume that this college spends its operating funds in proportions equal to that of the "average college of 1,401 students or above" represented in The Sixty-College Study.[25]

Sixty-College Expenditure Analysis
for Institutions of an Enrollment of 1,401 and up
(Percentages of Educational and General Expenditures)

	Percent
General Administration	5.9
Student Services	10.0
Public Services and Information	4.3
General Institutional	3.7
Instructional, Dept. Research	52.1
Organized Research	0.9
Library	4.8
Operation and Maintenance	18.5

A comparison of the income and expenditure profiles of our base institution and a cooperative institution is found on the succeeding page, but before we turn to this matter let us note the details of the cooperative institution's operations and the assumptions upon which the projection of increased income and expenditures are made.

The cooperative college to be used for comparison is located on a comparably-sized campus also valued at $42 million. This campus is built to accomodate 5,000 full-time students, but since this cooperative college operates an alternating program of study (two quarters per year) and work (two quaters per year), the college serves a combined student body of 10,000, each student of which is present on campus for full-time study two terms out of the year. The degree program in which the student registers requires five years to complete, but he pays no more tuition during these five years than his counterpart on the more traditional campus. His tuition and fees for each year he is on campus come to $1,840.

The cooperative campus will operate twelve months of the year, consequently the operating budget must expand to cover this extended operation. The campus will actually be open 33 percent longer than the nine-month campus but not all segments of the budget will expand to this extent. The assumptions are that the following increases are reasonable expectations.

Percent of Increase over Nine-Month Operation

	Percent
General Administration*	25
Student Services	33
Public Services and Information	no increase
General Institutional	25
Instructional, Dept. Research	33
Organized Research	10
Library	25
Operation and Maintenance	33

The income analysis is based upon The Sixty-College Study which gives this approximate divisions of current income:[26]

	Percent
Student Fees	64
Endowment	18
Other Restricted and Non-Restricted Gifts and Income Sources	18

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* This does not include the direct administrative costs of the cooperative program which will be added in the comparative profiles.

COMPARISON OF ANNUAL INCOME AND EXPENDITURE OF A COOPERATIVE AND NON-COOPERATIVE CAMPUS

CURRENT INCOME

Non-Cooperative (in thousands)		Cooperative (in thousands)
$11,500	Student fees	$18,400
3,250	Endowment	3,250
3,250	Other income, gifts	3,250
$18,000		$24,900

EDUCATIONAL AND GENERAL EXPENDITURES

Non-Cooperative (in thousands)		Cooperative (in thousands)
$ 1,062	General administration	$ 1,327.5
1,800	Student Services	2,394.0
774	Public services and info	774.0
666	General institutional	832.0
9,378	Instruction, Dept. research	12,472.7
162	Organized research	178.2
864	Library	1,080.0
3,330	Operation and Maintenance	4,428.9
$18,036		$23,487.3
	Coop. ed. administrative costs @ $100/student	1,000.0*
		$24.487.3

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*The cost of $100/student was taken from Northeastern **University's** (Boston) current experience in which a student body of approximately 14,000 is participating in cooperative education.

If the assumptions upon which the preceding comparison is based are reasonably realistic, we may conclude from this exercise that a campus under year-round cooperative operation where all students participate in the program can expect to have an operating budget which is no more difficult to balance than the traditional nine-month budget. The percentage of current income provided by student fees increases to cover increased operating costs.

Of course the savings in capital expenses have not yet been considered. Since, as we have noted in the Wilson-Lyons Report, the type of cooperative program analyzed above is 60 percent more efficient than the nine-month non-cooperative program in its production of graduates, it is reasonable to conclude that a sum of approximately $25 million in capital expenses has been saved by accomodating the additional 5,000 students on the year-round campus. Had an additional campus or campus enlargement of $25 million been necessary, and were this money to be raised by 7 percent bonds, the additional expense in interest alone would run to $1.75 million annually.

A few further comments are required regarding the institutional expense of administering the cooperative education program. As noted on page 20 - 31 the cost per student of $100 per year was taken from Northeastern University's experience. Not only does virtually the entire student body participate in the alternate work-study experience, making the alternating of student bodies on campus possible, but 70 percent of the students work within commuting distance of the campus in Boston. It has been found that personal contacts by the coordinator with the student and employer are strongly recommended in order to maintain the quality of the supervision and evaluation of the student's off-campus experience. Northeastern maintains a student-coordinator ratio of 300 to 1 and is able to conduct work-site visits with these students with the budget stated above because of the proximity of the students to the campus. When the students are scattered, travel and telephone expenses for the coordinators and travel time (which translates itself into a lower student-coordinator ratio) increase the administrative expenses of the program considerably.

In summary then, we have seen that a fully operating cooperative education program places no more demands upon the current income of an institution than a nine-month traditional curriculum. Further, in those cases where the change to a year-round cooperative campus has alleviated the demand for more construction, the possibility of savings in capital expenditures up to a maximum of 60 percent of the replacement value of the cooperative campus exists. But cooperative administrative costs are easily increased by changes in the model suggested, particularly if personal contact with the students in the field is insisted upon even when they have dispersed to work sites beyond reasonable commuting distance.[27]

The Costs to the Student

The Wilson-Lyons Report demonstrated that cooperative education institutions drew a higher percentage of students from the lower income segments of society than did non-cooperative institutions. Since these students are typically less able to afford a college education or less inclined for other reasons to attend college, this record of cooperative institutions is of considerable importance to educators interested in reaching the talented students from these strata of society. This in fact is the heart and the conclusion of McGlothlin's review of the Wilson-Lyons Report.

> ....the most important finding of all is at the same time the most obvious: "Because of the financial remuneration received by students for their cooperative work, the cooperative plan makes higher education feasible for many talented youth who might otherwise find college prohibitive." (p. 157) The fact that cooperative education does open colleges to such "talented youth" more than justifies its existence.[28]

The statistics from the Wilson-Lyons study which dealt with this question were quoted earlier (see page 20 - 20). We found from these statistics that approximately half of the cooperative students in the survey earned 70 percent or more of their total educational costs; about half of the non-cooperative students earned approximately 20 percent. What is lacking in this analysis of student income, particularly when cooperative income is being compared with the income of students on the non-cooperative plan, is the acknowledgement of the difference in the length of time over which the earnings are received. The cooperative student's earnings are calculated over a period of five years; the non-cooperative student's is calculated over only four years. When examining the real financial benefits of a five-year work-study program for the student the question should be phrased, which of the two alternative programs will leave the student in the stronger financial position five years hence? We shall examine these alternatives for three different students to see whether or not the five-year cooperative plan is the better strategy in all cases.

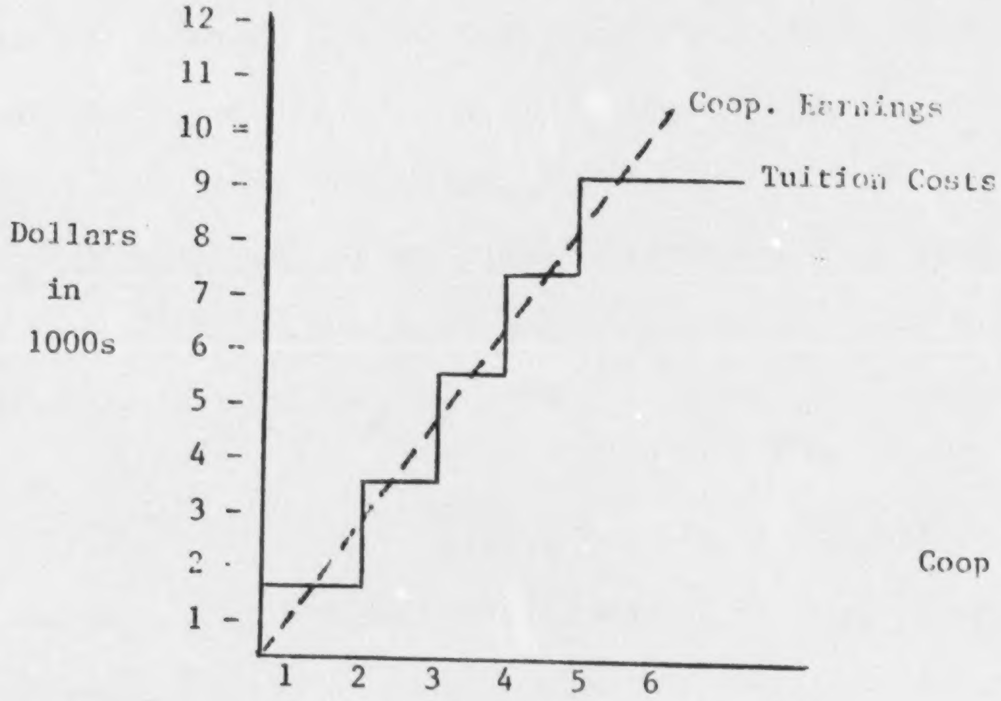
We shall use as our institutional models the cooperative and non-cooperative institutions discussed several pages earlier. The student has the option, it is assumed, of attending Coop U for five years for a total tuition of $9,200 or of attending Non-Coop U for four years at the same tuition rate of $9,200. The income of our three students will be fictional but based upon data from the Wilson-Lyons Report and the records of Northeastern University.[29] If our three students who are just ready to enter college had dependable information on what to expect during the next five years of their lives, they might be choosing between the following alternatives.

Student A is planning to study engineering.

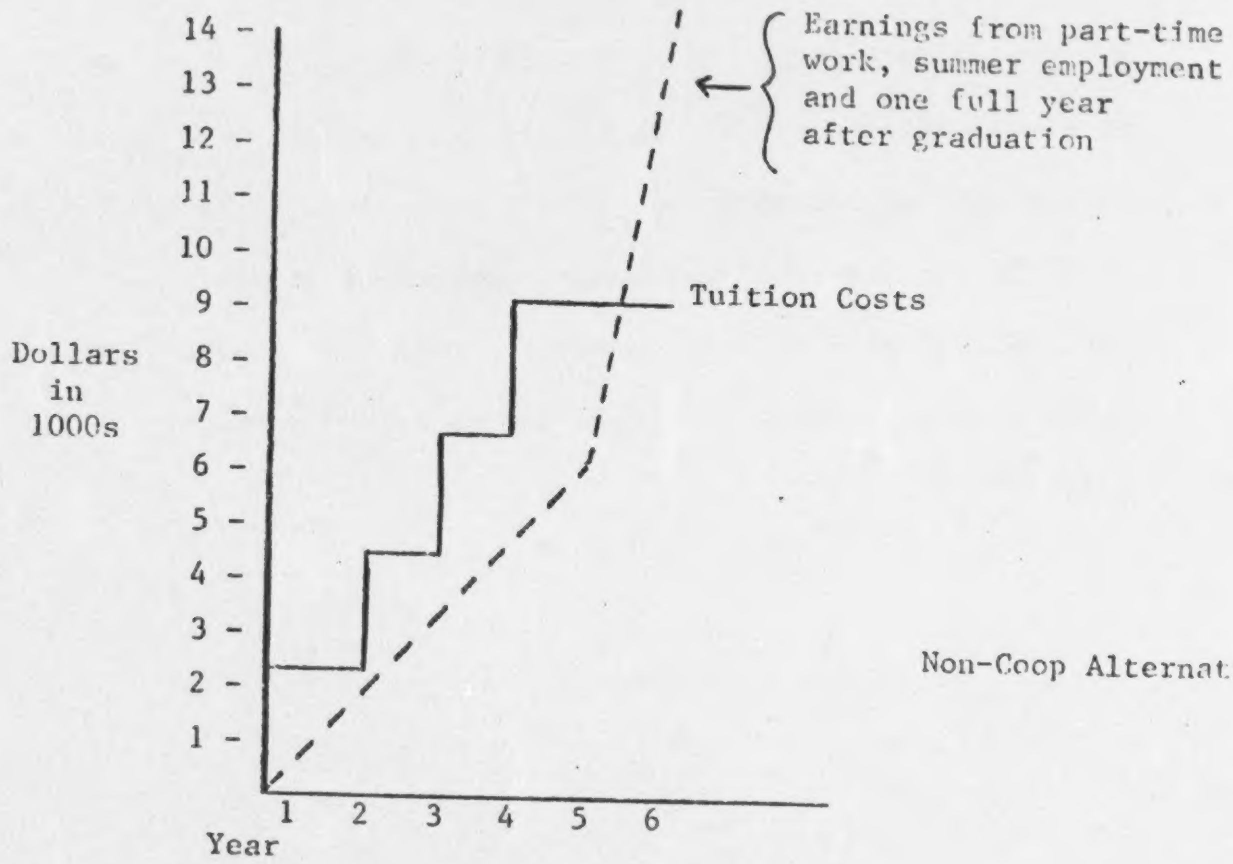
Coop alternative: If A attends Coop U. he will pay an annual tuition fee of $1,840 for five years, during which time he can expect to average $2,054 per year in income.

Non-Coop alternative: If A attends Non-Coop U, he will pay an annual tuition fee of $2,300 for four years. His income during this period will come from a part-time job (8 hrs./wk at $2.50 for 36 weeks) and summer employment at which he earns $1,000 each of four summers. Since A graduates in four years he will be able to take a job at $8,000 during the fifth year.

STUDENT A'S CUMULATIVE TUITION AND EARNINGS UNDER ALTERNATIVE PLANS



Coop Alternative



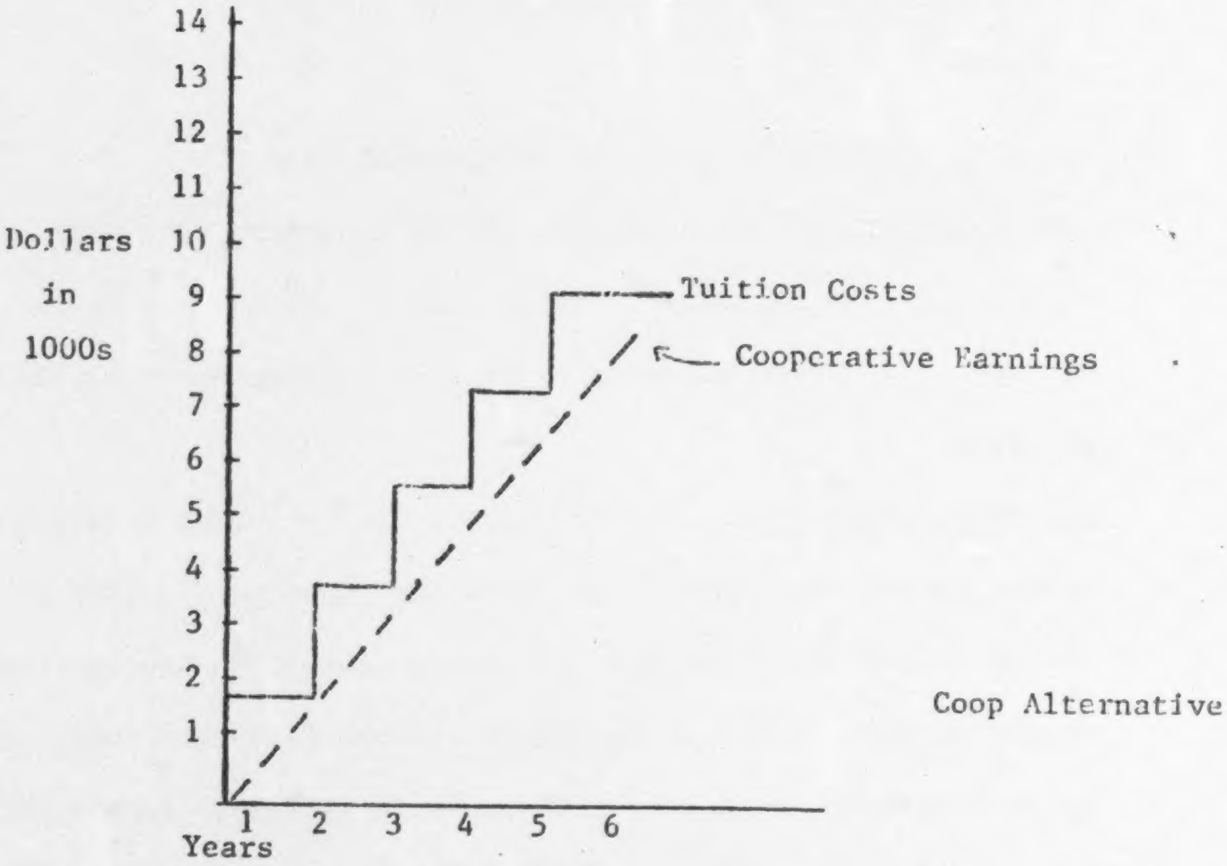
Non-Coop Alternative

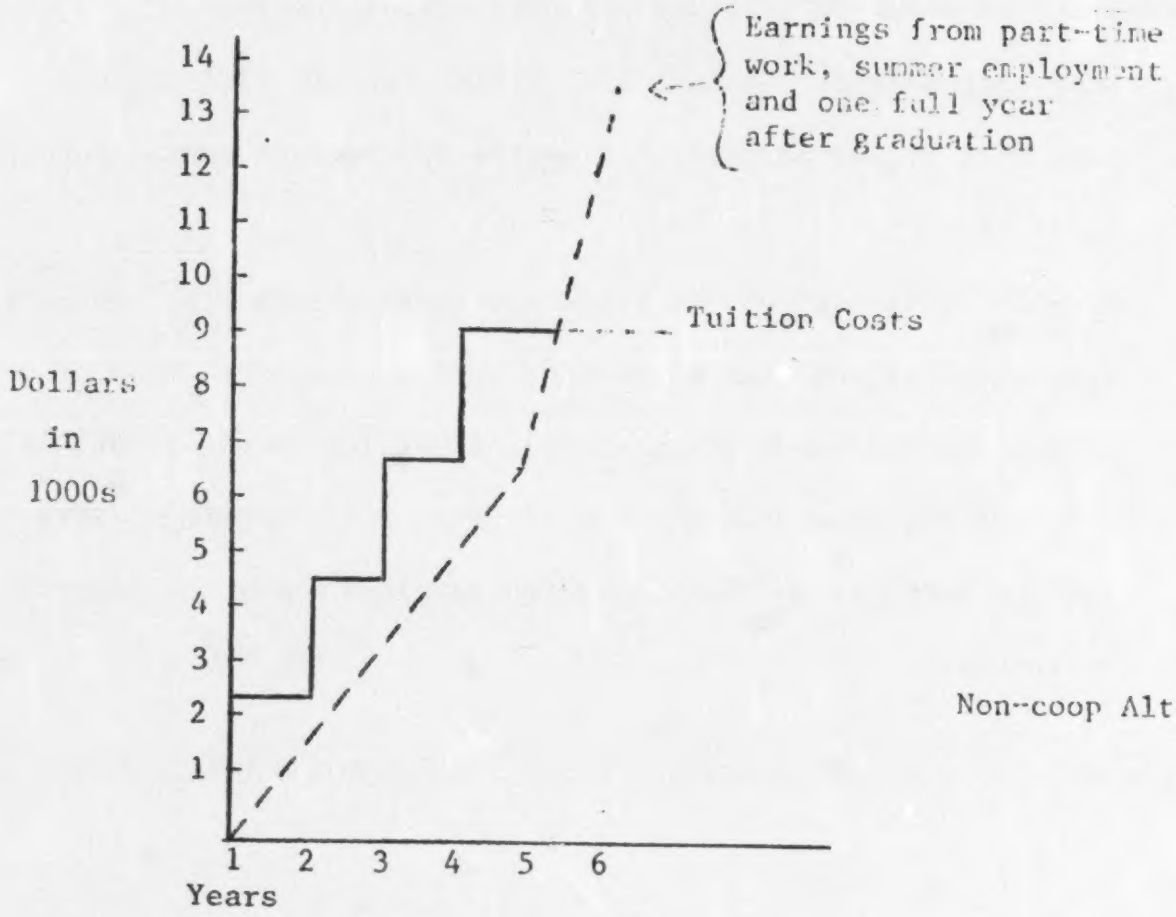
Student B is planning to study business administration.

Coop alternative: Student B's tuition for his five years at Coop U is $1,840 per year. His expected average annual earnings is $1,643.

Non-Coop alternative: If Student B takes this route, his part-time earnings and summer earnings will approximate those of Student A; his expected fifth year's earnings would be $6,400 (bearing the same relationship to Student A's expected fifth year of earnings as their expected earnings under the cooperative plan).

STUDENT B'S CUMULATIVE TUITION AND EARNINGS UNDER ALTERNATIVE PLANS





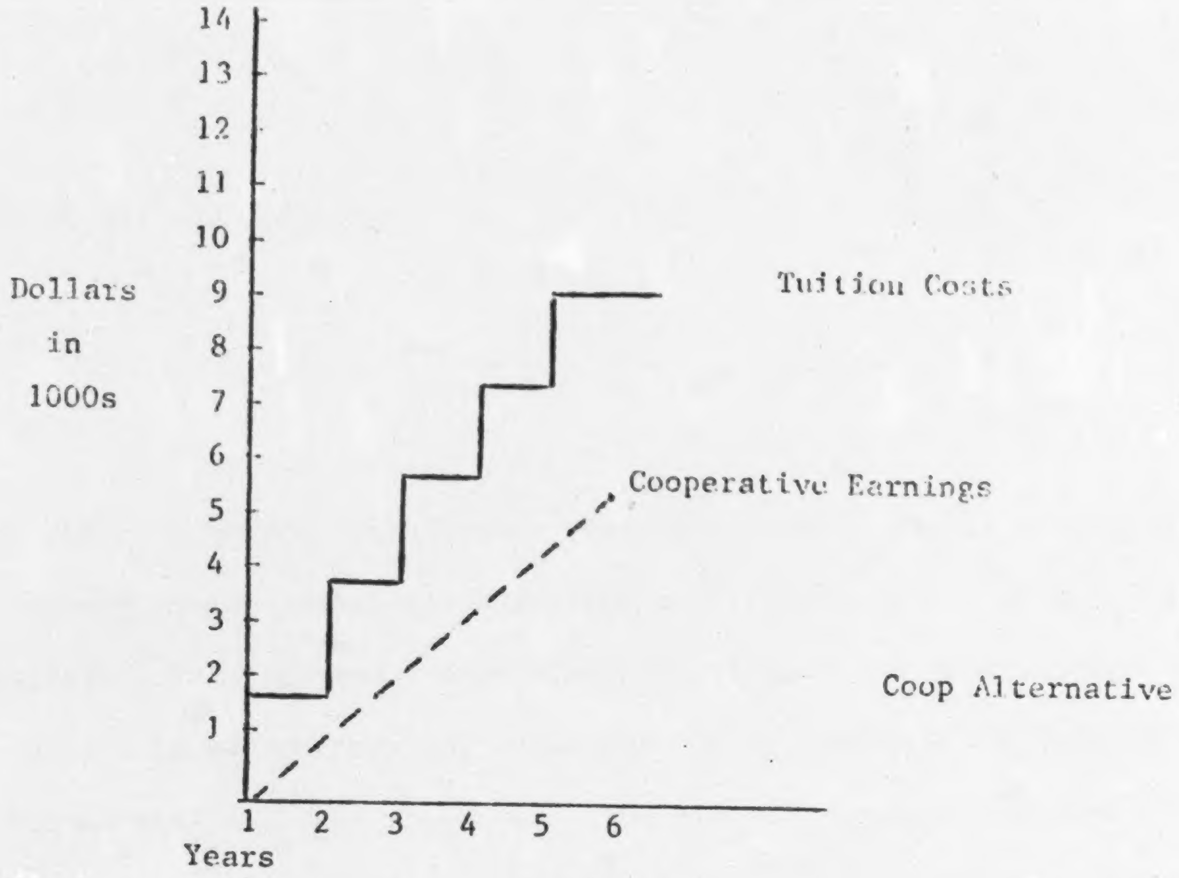
Non-coop Alternative

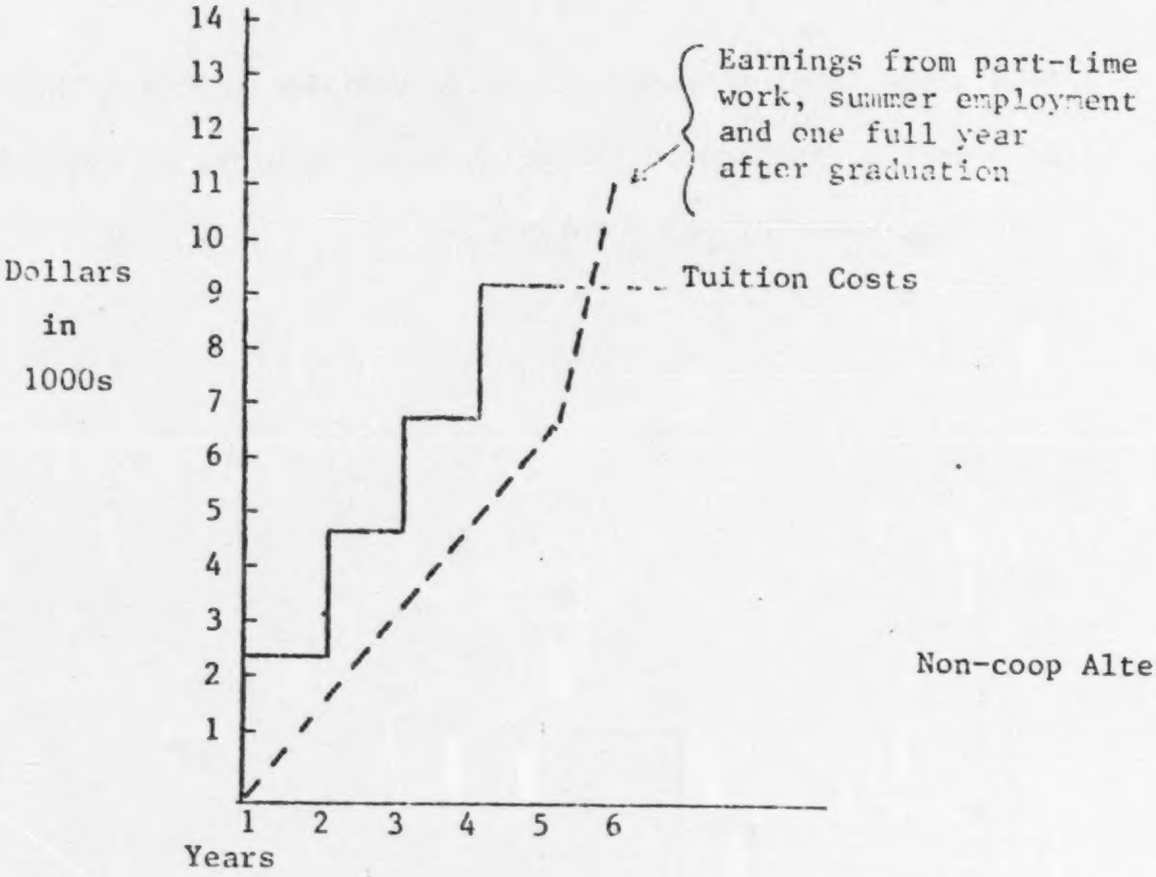
Student C is planning to major in the liberal arts.

Coop alternative: If Student C elects to attend Coop U he will pay $1,840 in tuition during each of the five years he attends. His cooperative earnings will average about $1,084 per year.

Non-Coop alternative: At Non-Coop U, C's part-time earnings and summer income would match that of A and B during his four years at the university. The year following graduation Student C may expect to earn $4,224 if he elects to work full-time rather than go on to graduate school. Although this estimated income is related to Student B's estimated fifth-year income on the same basis as the cooperative plan earnings are, the figure seems to be a gross underestimate of such potential earnings. The sum is nevertheless used in the graph below in order to maintain the consistency of the argument.

STUDENT C'S CUMULATIVE TUITION AND EARNINGS UNDER ALTERNATIVE PLANS





Non-coop Alternative

This analysis is of course greatly simplified. Living expenses are not included in these expenditures and computing living expenses could change the picture considerably for individual students. (If a student lives at home and commutes to a cooperative institution, he will face greatly increased expenses if his work assignment requires that he move to another city during that period of time.) But these simple graphs help to draw out certain noteworthy observations.

1. If part-time work during the school year, summer employment between the Spring and Fall terms, and full-time employment upon graduation are all available to the student, then the four-year non-cooperative Baccalaureate degree program is far more financially rewarding than the cooperative program. (If

only half-time employment were available during the fifth year, this would still be true.)

2. Liberal arts students may find that they can earn more annually by working part-time during a nine-month school year and augmenting that with full-time summer employment than by working under the cooperative plan.
3. The difference in cumulated tuition costs and cumulated student earnings represents a net indebtedness which varies greatly between paired alternatives for each student. In Student A's case his cooperative program would see this debt liquidated regularly during the year, finishing the five-year program with a small balance of earnings. His non-cooperative program would leave him with a debt of $2,300 at graduation. It is likely that many students would choose the cooperative alternative because of its conservative policy in borrowing money even though they were shown the probability of greater financial return under the non-cooperative plan.

The conclusion toward which these observations inevitably lead is that cooperative education on balance may not be the most financially rewarding alternative for the student who is required to pay his way through college. It depends, to be sure, on the student's chances for part-time employment and summer employment and, for that matter, on the possibility of finding a full-time job immediately after graduating from college. In a slow job market these uncertainties may be reason enough from the economic standpoint for a student to elect to follow the cooperative program in order to have the support of the university coordinators in finding work. In this case it would be advisable for the student to have an advisor spell out the alternatives with all their uncertainties rather than have the student elect cooperative education solely on the basis of its present claim to economic attractiveness.

The Costs to the Employer

In the cooperative education literature to date the topic of employer costs have been touched upon only briefly. One source included a quote from an opinion poll conducted by the American Society of Engineering Education in 1946 which suggested that students should share in the cost of their training and experience on the job by paying for it in their tuition.

> Cooperative plan is good. Industrial concerns participating in such a plan with a college or university should receive some remuneration for training the student during his working period. This cost should be included in the tuition fee.[30]

This is an isolated comment reflecting this opinion. In general, the spokesmen for cooperative education emphasize the benefits which the employers enjoy in participating.

The Wilson and Lyons Report records that "employers estimated that cooperative students offset the cost of their training anywhere from 50 to 100 percent, with a majority feeling that the cooperative student pays at least 80 percent of his way."[31]

The lack of further detailed data on this matter prohibits one from drawing any extended conclusions regarding the kinds of students or training situation which are most costly to industry. This aspect of cooperative education is one of the most data-improvished areas of the field at the moment and yet it is one in which there is potential for greatly increasing our knowledge about the effectiveness of higher education especially with respect to the preparation of professionals and semi-professionals for their chosen careers.

SUMMARY AND CONCLUSIONS

At the outset of this paper the point was made that cooperative education is but one of many ways educators are currently employing to extend the students' opportunities to learn beyond the campus. The essence of this type of program is the introduction of "non-scholastic goal directed activity" into the academic curriculum in a planned, integrated manner. After examining evidence relative to the claims of its proponents that cooperative education is an effective means of career preparation and an economical method for conducting higher education, we conclude that:

1. The Wilson-Lyons findings in their appraisal of cooperative education strongly support the educational claims of work-study proponents. The study however, does not adequately examine the question of cost (to university, students, and employer) in dealing with the very substantial claims which spokesmen of cooperative education have made of increased institutional efficiencies and the financial viability of the program for students of low income backgrounds.
2. On the basis of a rather sketchy analysis of scattered data, cooperative education programs may be deemed more economical for the

institution than traditional on-campus, nine-month academic programs if the entire student body is involved so that two divisions of the student body may be alternated on campus and if the work assignments for the large majority of the students are within easy commuting distance of the institution.

3. Again on the basis of data from various mixed sources, the financial attraction which cooperative education holds for the student has been oversold where the alternative of working part-time and through the normal summer vacation period exists.

As McGlothlin implied in his review of the Wilson-Lyons Report, the Report essentially defends cooperative education as being just as good as continuous academic work, but it does not demonstrate that cooperative students gain any more from five years than other students gain from the traditional four years. This is largely correct; the Report is defensive. The authors miss the opportunity to point out clearly the non-academic objectives achieved by cooperative education which are not reflected in the CEEB or ACE scores, nor in the GPA, yet are nevertheless considered important by academicians and employers alike.

Cooperative education will continue to expand to more campuses in the coming years; there seems little doubt of this. Today it is no longer merely desirable that the student learn to apply his knowledge to his practical affairs, it is also fashionable. But recent research has shown that the effect of cooperative education varies greatly among the various disciplines. We need to build upon the knowledge of the 1961 appraisal of cooperative education and find what effects planned, integrated non-academic goal oriented experiences have upon students in the social sciences, in pre-professional curricula and in other curricula not covered by Wilson and Lyons. Of the many questions which remain unanswered, the following are representative:

1. Do cooperative institutions show a greater or lesser attrition rate among students?
2. Are the departmental costs of educating an engineer or business administrator in cooperative education less expensive than at a non-cooperative institution (because certain training and facilities of the more expensive type are found at the work site)?
3. Is more mobility (either laterally or vertically) observable in the careers of cooperative students as compared with non-cooperative students?
4. Is a four-year cooperative program feasible?

It would not be fair to close without acknowledging the fact that, perhaps contrary to the impression this paper has given, there is a wide variety of types and patterns of cooperative education, some with specific vocational goals and others oriented solely towards the general education objectives of the traditional liberal arts curriculum. If educators will continue to use their imagination in this area and act with courage, cooperative education can become an effective instrument for broadening the education of American youth and building important lines of communication between the campuses and other segments of society.

Meredith Wilson pointed out to us the great psychological value to students with limited personal resources of having some assured income during the college career; many of them would give up, to obtain that security, some of the promise of higher income at the end of the four-year program. During the "great depression" he observed rural students who left home to attend Cincinnati, which was able to maintain its opportunity connections, who would not likely have left home for any other kind of institution of higher education. Kenneth Boulding raised the question of whether the five-year program with no respite might not be terribly exhausting and hence rather unattractive to most students in comparison with the traditional pattern with long summer vacations. Perhaps it would be; on the other hand, perhaps the complete change of scene every six months would provide refreshment somewhat comparable to that of the summer vacations (during which many students work). He also questions whether enough suitable work opportunities could be found if there were extensive conversion of higher education to the cooperative pattern. It might be reasonable to expect that the standards of "suitability" would have to slip somewhat but, if higher education is in tune with the requirements of social careers, we would expect the categories of work being done in society to be roughly proportional in size to the number of persons learning to do those categories of work.

NOTES

[1] James W. Wilson and Edward H. Lyons, *Work-Study College Programs: Appraisal and Report of the Study of Cooperative Education*. (New York: Harper and Row Publishers, Inc., The Study of Cooperative Education was supported by a $95,000 grant from the Fund for the Advancement of Education and carried out under the auspices of the Thomas Alva Edison Foundation. Ralph W. Tyler served as chairman of the Study Committee which supervised the project and he wrote the Introduction to the Wilson-Lyons Report.

[2] From a statement of purpose on the inside cover of the Comission's publication authored by Asa S. Knowles, *A College President Looks at Cooperative Education* (New York: National Commission for Cooperative Education, 1964).

[3] Cooperative Education Association, *A Directory of Cooperative Education* (Philadelphia: Cooperative Education Association, S. A.Collins Executive Secretary, Drexel University, March 1970), p. 7.

[4] James W. Wilson, "Survey of Cooperative Education, 1969", *Journal of Cooperative Education*, (November, 1969).

[5] Trudy W. Banta and Douglas C. Towne. *Interpretative Study of Cooperative Efforts of Private Industry and the Schools to Provide Job-Oriented Education Programs for the Disadvantaged* (Washington D. C.: Office of Education Project 8-0610 Report, 1969), p. 118.

[6] *Ibid*., p. 49f

[7] *Ibid*., p. 118

[8] B. Lamar Johnson, "Cooperative Work-Study Education" Chapter 4 in *Islands of Innovation Expanding: Changes in the Community College* (Beverly Hills: Glencoe Press, 1969), p. 55.

[9] Work Experience Education Advisory Committee of the American Association of Junior Colleges. The "Guidelines" mentioned here are expected to be available in 1971.

[10] An older study of work experience programs on the junior college campus which contains information still relevant and useful in Melvin L. Barlow's *A Survey of Junior College Work Experience Education Programs*, 1962-63 (Los Angeles: Division of Vocational Education, University of California, Los Angeles, 1963).

[11] Wilson and Lyons, *op. cit*., p. 19.

[12] Henry H. Armsby, *Cooperative Education in the United States* (Washington D. C.: Office of Education, Bulletin 1954, No. 11) p. 1.

[13] *Ibid*.

[14] *The Co-op Handbook, 1969-1970* (Boston: Northeastern University) p. 3.

[15] James W. Wilson, *op. cit*., p. 13.

[16] James W. Wilson, *op. cit*., p. 9.

[17] *loc*. *cit*.

[18] James W. Wilson, *op. cit*., p. 12.

[19] See Note 1 for complete entry.

[20] Henry H. Armsby, *op. cit*., p. 54.

[21] For example, on page 28 Wilson and Lyons indicate that very few liberal arts students live at home and commute; whereas more business administrator and engineering students commute. It might be questioned whether living in the dormitories is a function of majoring in the liberal arts or attending a rural campus.

[22] Chapter nine is authored by President Edwin D. Harrison of Georgia Institute of Technology who gives credit for prior analyses upon which his material is based to Donald C. Hunt and James W. Wilson.

[23] A critical review of the Wilson-Lyons Report written by Vice President William J. McGlothlin of the University of Louisville in *The Annals of the American Academy of Political and Social Science*, Vol. 342 (July 1962), p. 219.

[24] See analysis referred to in note 22.

[25] The National Federation of College and University Business Officers Associations, *The Sixty-College Study--A Second Look, 1957-58* (The National Federation of College and University Business Officers Associations).

[26] Ibid., p. 70 (Exhibit XIV).

[27] For the reader who is interested in a similar but much more extensive cost analysis of cooperative education I recommend a recent paper by Morton A. Rauh, *The Financial Advantages of Work-Study Plans* (Yellow Springs, Ohio: Antioch College, June 1970). I obtained a copy of this

paper after the completion of this chapter and thus was unable to incorporate many of the excellent points which Rauh presents.

There is one significant difference between our analyses of costs which must be mentioned; it is essentially the difference between Northeastern University's policy in charging tuition and Antioch College's policy. Northeastern's policy is to charge the same total tuition (T) for a 5-year cooperative B.A. program (thus, annual tuition equals T/5) as for a 4-year non-cooperative B.A. program (thus, annual tuition equals T/4). Antioch's policy is to charge the same *annual* tuition whether the student completes his program in 4 years or in the more normal period of 5 years.

[28] William J. McGlothlin, *loc. cit.*

[29] James W. Wilson and Edward H. Lyons, *op. cit.*, p. 122 report the average total amounts earned by cooperative students in the study were $7,000 for engineering students, $5,600 for business administration students and $3,700 for liberal arts students or a ratio of 1.25 to 1.0 to 0.66. Northeastern University reports that its student body of 14,000 earned $25 million during the last academic year or an average of $1,643 per student. The student examples employ the Wilson-Lyons ratio of earnings with the Northeastern University average as a more current income figure for the business administration student. The engineering and liberal arts students are adjusted accordingly.

[30] Henry H. Armsby, *op. cit.*, p. 38.

[31] James W. Wilson and Edward H. Lyons, *op. cit.*, p. 154.

CHAPTER 21

MANAGEMENT IN INSTITUTIONS OF HIGHER EDUCATION

SUMMARY

Institutions of higher education in general have not implemented institutional research (IR), computerized management information systems (MIS), and planning-programming-budgeting systems (PPBS). This phenomenon in itself is not an indictment of institutional effectiveness, for the technological dimensions of management exemplified by these techniques is but one of three closely interrelated dimensions of effective management. Nevertheless the state of the socio-psychological and structural dimensions is determined in large part by the state of the technological dimensions; hence, one must question the capacity of institutional administrators to manage effectively in the face of mounting social and economic pressures for accountability.

Less than one quarter of the institutions responding to our mailed Institutional Management Questionnaire reported a full-time office for institutional research; slightly more than one-eighth have established computerized management information systems; and approximately one-third use some form of planning-programming-budgeting system. Of even greater significance however, only 2.8% of the 1,873 institutions responding had all three.

Chart 1 - Percentage of Responding Institutions that Have Implemented Institutional Research, Management Information or Planning-Programming-Budgeting Systems (N = 1,873)

IR	MIS	PPBS	ALL THREE
24%	13%	31%	2.8%

The Institutional Management Questionnaire (see appendix to this chapter) was mailed to the chief campus officers of the 2,537 institutions of higher education listed in the Education Directory, 1968-1969/Part 3, National Center for Educational Statistics, U.S. Office of Education. Usable responses were received from 1,873 (74%) of these schools and the analysis of these responses forms the body of this report. The responses were classified as to type of control (public or private) and were categorized in each classification by size of student body and highest degree offered. Responses were received from 884 public schools and 989 private schools. This ratio of 47 public schools to 53 private schools compares with the Directory ratio of 41 public schools to 59 private.

Nearly three-quarters (73%) of the responding schools had a student body of less than 3,000 students. Among the private schools alone, 90% had less than 3,000 students and only 6% had student bodies of 6,000 or more. The distributions of public schools above and below 3,000 students was almost equal, with fifty-five percent of the public schools having less than 3,000 students (Chart 2).

Chart 2 - Size Distribution of Institutions Responding by Type of Control and Size of Student Body

	No.	Under 3,000	3,000 or More	6,000 or More
Public	884	55%	45%	27%
Private	989	90%	10%	4%
Combined	1,873	73%	27%	15%

The large number of schools, both public and private, with student bodies of less than 3,000 students could be expected to have a significant influence upon the percentage of schools that have implemented instituional research, computerized management information systems and planning-programming-budgeting systems. Such schools, being relatively small in size, would be expected to have less complex organizational structures, more homogenous student bodies and consequently feel less need for full-time institutional research offices and computerized management information systems. This hypothesis appears to be borne out by the responses received. In the case of institutional research this is certainly true. A majority of the larger schools (6,000 or more students) have established full-time offices for institutional research while only a handful of the smaller schools have extablished such offices (Chart 3). Among the small public schools, junior colleges appear to be the most interested in institutional research, while among small private schools those offering the Bachelor's degree represent the largest percentage (Chart 4).

Chart 3 - Percentage of Schools Having a Full-Time Office for Institutional Research by Type of Control and Size of Student Body

	All Sizes	Under 3,000	3,000 or More	6,0000 or More
Public	35%	15%	59%	70%
Private	14%	10%	46%	67%
Combined	24%	12%	57%	69%

Chart 4 - Percentage by Highest Degree Offered for Small Schools (less than 3,000 students) Having a Full-Time Office for Institutional Research

	No.	Jr. College (Less than BA)	Bachelor's	Graduate
Public	75	57%	17%	25%
Private	91	8%	59%	33%
Combined	166	30%	40%	30%

The effect of institutional size is equally apparent in schools that have implemented a computerized management information system. The difference in percentage between small schools having MIS and large schools having MIS is not as great as between small and large schools having offices for institutional research. In fact, among private schools the percentage of schools having MIS actually decreases as the student body increases to 6,000 or more students (Chart 5).

Chart 5 - Percentage of Schools Having Computerized Management Information Systems by Type of Control and Size of Student Body

	All Sizes	Under 3,000	3,000 or More	6,000 or More
Public	18%	10%	27%	32%
Private	9%	7%	30%	29%
Combined	13%	8%	27%	32%

In contrast to institutional research and management information systems, the size and type of institution appear to have little effect on the implementation of a planning-programming-budgeting system. With the exception of one category, the percentage of schools in each category that has PPBS does not vary significantly from the average for all categories. This one exception, private schools having 3,000 or more students, is the result of the large percentage of planning-programming-budgeting systems among the schools with 3,000 to 5,999 students (Chart 6).

Chart 6 - Percentage of Schools Using Planning-Programming-Budgeting Systems by Type of Control and Size of Student Body

	All Sizes	Under 3,000	3,000 or More	6,000 or More
Public	31%	31%	32%	31%
Private	30%	30%	37%	33%
Combined	31%	30%	33%	31%

A number of schools that do not have their own institutional research office or computerized management information system obtain these services as members of a consortium. This method is somewhat favored by the smaller schools (Chart 7).

Chart 7 - Percentage of Schools Obtaining Institutional Research and Management Information Systems as Members of Consortia by Type of Control and Size of Student Body

	Under 3,000		3,000 or More		6,000 or More	
	IR	MIS	IR	MIS	IR	MIS
Public	11%	10%	5%	8%	6%	8%
Private	11%	5%	2%	2%	4%	2%
Combined	11%	7%	5%	7%	6%	7%

The responses to individual questions on the Institutional Management Questionnaire provide some indications of the state of the technological dimension of management. But an even more significant indication is provided by the combinatorial responses. Whether a large, complex institution, for example, can have an effective planning-programming-budgeting system, or for that matter an effective office for institutional research, without a computerized management information system is questionable. Yet only 2.8% of the institutions responding had all three. An additional 3.1% had a full-time office of institutional research and a computerized management information system, while another 3.8% had no institutional research office but did have a planning-programming-budgeting system together with MIS (Chart 8).

Chart 8 - Combinatorial Responses - Percentage of Schools Having the Combinations Shown

	Have IR Have MIS Have PPBS			Have IR Have MIS No PPBS			No IR Have MIS Have PPBS		
	C	Pub.	Pvt.	C	Pub.	Pvt.	C	Pub.	Pvt.
All Schools	2.8%	4.2%	1.5%	3.1%	5.2%	1.2%	3.8%	4.5%	3.1%
Under 3,000 Students	.9%	1.0%	.8%	.9%	1.7%	.4%	3.1%	4.1%	2.6%
3,000 or more Students	8.0%	8.0%	8.2%	9.2%	9.5%	8.2%	5.4%	5.0%	8.2%
6,000 or more Students	10.0%	11.0%	11.0%	13.0%	13.0%	13.0%	5.3%	5.5%	4.2%

C = Combined Pub. = Public Pvt. = Private

Twelve combinations of responses to questions on institutional research, computerized management information systems and planning-programming-budgeting systems were selected for analysis. These twelve were the only combinations of answers which were reported by at least 3% of the institutions in one or more categories, and hence represent the largest percentage of combinatorial responses reported. As indicators of effective management, the figures are dissapointing. In fact, the combination reported by the largest percentage of schools (28%) was (1) administrators do IR as needed, (2) there are no plans for computerized management information systems, and (3) PPBS is not used, but again this precentage was made up primarily of smaller schools.

The combinatorial responses did not fully substantiate the proposition that institutional research is at the heart of the trend toward the implementation of modern management techniques. In public schools, 19% of the schools having offices for institutional research also planned to implement computerized management information systems, while 5.5% of the schools without institutional research offices planned to implement MIS. But among private schools, 5.4% of those with institutional research offices planned to implement MIS and nearly 16% of the schools that had no institutional research offices were planning for a management information system (Chart 9).

Chart 9 - Percentage of Schools Planning for MIS by Type of Control

	Have IR Plan MIS	No IR Plan MIS
Public	19%	4.5%
Private	4.4%	16%
Combined	12%	17%

In addition to answering questions concerning institutional research, computerized management information systems and planning-programming-budgeting systems, each addressee was asked to specify in his own words the most significant improvement that had been made in his administrative procedures during the past five years. The most frequent response was that a computer was now being used to store and manipulate statistical data. Less frequently the implementation of scientific management techniques was mentioned as were organization of a planning group and reorganization of the corporate structure. Better communications with faculty and students was also mentioned, but less frequently than the above.

The lack of research into the cost-benefits of modern management techniques, when applied to institutions of higher education, has unquestionably slowed the acceptance of these techniques by college and university administrators. A simple understandable treatise on the implementation of scientific management in institutions of higher education together with a research-backed discussion on their benefits is badly needed. Additional research is needed on the many questions raised by answers to the Institutional Management Questionnaire. How effective, for example, are the planning-programming-budgeting systems and management information systems that the respondents say they are using? How does the effectiveness of an office for institutional research compare with institutional research done by administrators and staff? Are institutional research and management information systems shared in consortia adequate? Is there some point where the size of the institution is so small and the complexity of its organization so minimal that all needs for modern management techniques vanish?

Such research would do much to dispel the air of mysticism surrounding scientific management and clear the way for a fuller appreciation of the contribution that scientific management could make to institutioanl effectiveness.

INTRODUCTION

The American system of higher education is an agglomeration of institutions that differ in origin, size and purpose and have large variations in the quality and quantity of students, faculty, administrators, services and facilities. Traditionally, each institution is considered to be unique and to a limited extent this premise has some basis in fact since each institution does have its own attributes of identity, its own history of leadership and its own hallowed traditions. This is true as well in business and industry. However, managerial effectiveness in business and industry is based upon a long history of empirical research conducted in a competitive market place, whereas T. R. McConnell pointed out in 1963 that "So little research has been done on how colleges and universities are organized and administered that it is fair to say, in fact, that the field has not been touched."[1] Dr. McConnell's statement appears to be equally applicable today. Nevertheless, there are sufficient similarities in administrative problems and in operation requirements to justify the conclusion that some general criteria for effective management could have been developed.

Of course good management of and within educational institutions is of interest to those associated with higher education. In the past, however, attempts to emulate the practices of business and industry have led to less than satisfactory results. During the period from about 1910 to 1930, the big theme of pioneers in scientific management was efficiency and the concept "efficiency in the knowledge industry" was carried to extreme lengths in the name of better education. In a frequently cited example of the period, one school system found that a dollar purchased 238 pupil recitations of French but only 5.9 pupil recitations of Greek. The conclusion drawn was that unless the price of Greek was reduced, the school system should invest in something else. Similar attempts by other educational institutions to apply the scientific management approach of industry resulted in equal absurdities, and the stress on emulating industry subsided somewhat as an aftermath of the Great Depression.[2]

Unfortunately, while industry was able to invest large resources in organizational and management research, institutions of higher education were either unwilling or unable to do likewise. Lyman A. Glenny reports that prior to 1945 there was an evident lack of system and rationality of organization in the development of colleges and universities throughout the United States.[3] As a consequence, diversity was cherished and the classic conditions of institutional autonomy in higher education prevailed. Even in the postwar years little attention was paid to the need for efficient and effective management of the institution's resources. The pressure was on expansion, not management efficiency. But as the system of higher education grew so did its complexities, and today higher education has become a complex, multifaceted paradigm of big business.

Whether or not higher education, even as it exists today, can survive without good management is questionable. Yet, many educators are predicting even larger enrollments and far more complex facilities. Lewis B. Mayhew in a report to the National Institute of Health says that enrollments in college degree work will rise from 1955's total of 2.7 million to an estimated 9 million in 1975, and graduate enrollment may well reach 1.1 million students. Some 80-85 percent of these students will attend public institutions having over 20,000 students.[4] In Colleges Today and Tomorrow

Mayhew reports that the University of Minnesota expects 50,000 students on its Minneapolis campus within the decade and Michigan State plans for 40,000 students at East Lansing in the early 1970's.[5] Alvin C. Eurich believes that as a result of urbanization, the largest universities, with their clusters of professional and graduate schools and research institutions, will have become by the year 2000 virtually self-contained cities. Some like New York University will enroll more than 200,000.[6]

With increasing size will come increasing financial problems. It is said that expenditures for higher education will nearly double from $11.4 billion in 1965-66 to $22.5 billion in 1975-76 and capital outlay during the period 1966-67 to 1976 will be more than $30 billion--compared with the entire gross national product of $56 billion in 1933.[7] In a study for the Southern Regional Education Board, Lanier Cox noted that federal aid to education is creating a new series of questions. There is little discussion today on whether there will be federal aid. The questions are: What type? How much? Who administers it? What impact will it have? State administered federal aid programs to higher education have led to an increased awareness of the need for a formal mechanism to coordinate the programs of colleges and universities.

The ever increasing size, complexity and cost of higher education have caught the interest of a public that was content a few short years ago to leave education in the hands of the educators. Modernization and conflict will be paramount among the broad changes in universities to be expected during the next decade as state systems, under the economic pressures accompanying the rapid expansion in higher education, exert greater control by the use of computers and systems analysis to determine allocations and needs.[8] For example, the governors of 41 states have indicated that gubernatorial support for education was never higher; however, institutions of higher education must aid gubernatorial attempts to secure more money for them by providing better justifications for the increased resources. While governors may not interfere with professional administrators on campus, they will influence educational policy indirectly through budgeting.[9] James A. McCain, reporting in 1966 to the Advisory Commission for the Higher Education Study of the State of Maine, said:

> All over the country higher education's role is being defined and redefined as the need for its services and benefits becomes clearer. Dramatic changes are taking place in the methods of instruction, in the forms of statewide organization, in the content of programs, and in the roles of government--State and Federal.[10]

One of the more significant changes taking place in higher education is the societal and economic pressure for accountability from institutional administrators. As early as 1965 Glenny, in describing new state systems and plans for higher education, stated that:

> Diversity continues to be cherished and encouraged by all, but today the unlimited freedom of a college or university to pursue a self-determined destiny is rapidly being curtailed among the public institutions and even has the prospects of diminishing among the nonpublic ones. At the state level the new watchwords are cooperation and coordination with institutional independence only within certain new parameters....The new coordination did not arise out of foresight by educators but from demands of legislators and governmental agencies for more efficient use of public monies.[11]

Mayhew supports this viewpoint when he says:

> By 1980 every state will probably have a State master plan for higher education and some form of statewide coordination and control. Higher education has become too expensive and too significant for state governments to allow it to function in the laissez-faire manner of the past, and the increasing needs of higher education for governmental subsidy is apt to conflict with university integrity and desire for autonomy.[12]

Additionally, a new kind of interest in the student himself is evolving, along with new efforts and demands to measure the effectiveness of education. In a sense, until relatively recent times at least, the tendency was to emphasize student limitations. The university served in loco parentis and the only responsibility of the student was to accommodate himself to institutional demands as he was "processed" through the institution in a routine manner. Today a politically mature student body is applying pressure for greater recognition and administrators must pay more attention to the unique combination of qualities that make each student an individual.[13] The changes through which we are living have indeed created new social needs. To meet these needs the universities must change in size, function, and in relation to their environment. Equally as important, however, they must also change the way in which they manage their affairs, and this change has not been made.[14]

All institutions of higher education keep records and from time to time these records are examined to see what the institution has done in the past; registrars and admissions officers take the time to conduct studies to indicate the trends for the future; financial officers conduct periodic budget exercises and campus architects develop construction programs. However, in the face of external pressures for accountability and internal pressures for relevence, these uncoordinated attempts at management no longer suffice. Higher education stands accused of poor planning; of being insensitive to the needs of society; of ignoring recent technological developments that could make teaching more effective; of being unable to provide valid information on its operation; of ineffectual use of resources. Unless educators become aware of the need for recognizing and developing new management techniques and measures of good management, institutions of higher education could end up with vast numbers of students, many dollars being spent on tuition and resources, and a multitude of facilities, but providing only a small fraction of the higher education needed.

In the last decade both military and business establishments have developed new ways to improve the administration, individual productivity and the cost effectiveness of their operation. Rather than merely collecting information on the past or current state of operation, these organizations have collected data covering a wide range of possible actions. Analysis of the data then provides a range of alternative courses of action for future operations. This procedure has as its objective imaginative and effective decision-making by means of setting goals, seeking alternatives, and evaluating results. Such a procedure is called "systems analysis" and the systems approach is already accepted as a management tool by some educators. It is being used by state legislators and coordinating boards in studies which involve entire school systems as well as studies which concentrate primarily on individual schools and departments. The U.S. Office of Education, the National Science Foundation and the American Council on Education have all recognized the applicability of the systems approach and have sponsored studies covering various aspects of its use. The power of the systems approach lies fundamentally in the fact that it can promote and amplify incisive thinking. From one point of view it may be regarded as applying the scientific method to the art of getting things done.[15]

If colleges and universities are to retain any measure of autonomy whatever, they must realize that freedom presupposes responsibility. If they want freedom of operation along with financial help then they must respect the donor's demands for accountability; otherwise they will find that those providing the resources will demand a greater say in their expenditure. Whether college and university administrators are capable of voluntarily achieving the long-range as well as the immediate objectives being newly required of American higher education remains to be seen. Concerted effort is necessary and institutions no longer have any option between disjointed laissez-faire enterprise on the one hand and planned integrated activity on the other. As Logan Wilson says, "The only real choice remaining for institutional and associational leaders is whether they will get together to exercise major initiative in the reorgainzation of higher education, or stand aside while others assume this role."[16] To this end, scientific management and systems analysis provide an opportunity for institutional administrators to develop a common repertoire of good management practices. The systems approach is not a guarantor of "good" management, nor is it the sole hope of administrators faced with new challenges to their administration; it is however, one approach to management which has a proven history of success. This is not to say that educational institutions should again attempt to emulate industry. But scientific management recognizes the fundamental importance of intensive self-research, of defining objectives and of gathering and analyzing relevant information; consequently it does have something to offer higher education. The college or university president must put to work the best methods of management that have been devised. If the president does not seek and apply the best techniques that have been developed, he simply cannot be informed about what is going on nor can he justify and allocate his resources in an effective manner.[17]

Granted that good management practices are essential to institutional viability, the question of identifying these practices still remains. Traditionally, business and industry have used efficiency of operation to determine the value of specific management procedures. Efficiency can only be determined with precision, however, when the inputs and processes of the organization can be quantitatively stated in relation to measurable outputs. This sort of quantitative comparison is difficult if not impossible to determine in a college or university.[19]

Efficiency, however, is not the sole criterion for determining the existence of good management. While efficiency--doing things right--is important, effectiveness--doing the right things--is a great deal more important.[19] There is, certainly, little to be gained by doing the wrong things with great efficiency. But in order to do the right things, the administrator must know what is expected of the institution. Today, governmental agencies, participants in the education process, and society at large are all seeking a greater voice in determining the purpose of higher education. To use a cliche, "society is on the move," and evolution, if not revolution, is causing recurring change in the purposes and objectives toward which the institution must strive. Hence, in order to do the right things the college or university administrator must develop within his institution a capacity to cope with change. As James I. Doi says, "The capacity to cope with change must today be recognized as a major criterion of organizational effectiveness."[20]

This capacity of an organization to cope with change depends to a great extent upon the inherent flexibility of the organization and its chief administrator. That is the ability of the technological, social-psychological and structural dimensions of management to adapt rapidly and successfully to changing demands. Such flexibility can only be achieved through the application of the principals of scientific management. Consequently the search for measures of good management in colleges and universities can be directed toward identifying the extent to which these concepts are used.

Characteristically, institutions of higher education that have adopted the concepts of scientific management will have developed a management organization which provides for the following functions:

1. Conduct of a critical and continuous self-examination of curriculum and administrative and operational procedures; examination of the relevance of established goals and objectives; evaluation of selection and processing procedures; understanding of the participants in the education process and a continuous examination of the environment in which the institution operates.

2. Establishment of relevant goals and objectives; justification for and allocation of resources commensurate with current and future demands for these resources and objectives; continuous accountablility for the expenditure of resources; maintenance of flexibility in goal-oriented operations.
3. Development of timely and valid information in order to achieve the above and to enhance the validity of decisions.

The first of these functions has generally been performed by members of the institutional staff or the various department chairmen, deans and faculty members as the need arose. In recent years there has been a trend toward consolidation of these responsibilities, from the viewpoint of the total institution, under an office variously titled "Office of Institutional Research," "Office of Educational Development," "Office of Institutional Surveys," and so forth. The generally accepted title today is "Office of Institutional Research."

The second of these functions is realized in the "Planning-Programming-Budgeting System" used by the Federal Government, some state governments and various school districts. Within a college, university or any system of higher education the responsibility for developing such a system is generally assigned to a specific office; however, the use of PPBS requires participation by all persons associated with resource justification and allocation as well as with long-range planning. No single office can exercise sole responsibility for the effective development and use of PPBS, hence the extent of its use cannot be determined by searching for a specific sub-structure within the institution.

The third function is essential to the other two. It is ususally achieved through the use of a "Management Information System" which uses a computer to store and manipulate the required data. A MIS need not be computerized but simulation models of enrollment projections, resource allocations and the like generally require computer assistance.

These, then, are the three pre-conditions for effective management in higher education:

1. Institutional Research
2. Adoption of a Planning-Programming-Budgeting System
3. A computerized Management Information System

It is not mandatory that each institution have the capability to perform all of these functions within its own organization. Many institutions, because of their size or simplicity of operation, will find it neither practical nor economically feasible to develop a structure that provides this capability but instead will employ consultants from time to time. Others will join or organize consortia for the purpose of sharing costs, skills and knowledge. Nevertheless, the employment of modern management techniques is indicative of an organization's capacity to cope with change.

The following sections examine in detail the results of a survey conducted to determine the extent to which institutions of higher education have adopted the three pre-conditions for effective management. By determining the extent to which campus administrators have implemented institutional research, planning-programming-budgeting, and computerized management information systems, a model of the potential for managerial effectiveness can then be developed.

In addition to the survey, a search was made of pertinent literature in an effort to determine what research, applicable to colleges and universities, had been accomplished in the institutional research, planning-programming-budgeting and management information areas. This search revealed no significant research on the effectiveness of these techniques in higher education. In fact, although there was a considerable body of literature on PPBS and MIS in general there was only a small amount directed at their implementation in institutions of higher education. (UCI Handbook for Academic Planning is an example.) No research was found which attempted to determine the extent or the use of all three in higher education.

SECTION I

THE INSTITUTIONAL MANAGEMENT QUESTIONNAIRE

To develop a model of the potential for managerial effectiveness and hence the capability to cope with change in institutions of higher education, an institutional management questionnaire was developed to determine the extent to which the three pre-conditions of effective management were employed. The questionnaire was designed to give answers to such major questions as: To what degree are variables such as size of institutions, highest degree offered and type of institutional control related to the implementation of the three pre-conditions of effective management? Are some states or regions more progressive than others in the use of institutional research, computerized management information systems, and planning, programming, budgeting systems? Can inferences be supported concerning the implementation in a single institution of more than one of the three pre-conditions of effective management? What was the most significant change in institutional administration in recent years?

Methodology

During development of the questionnaire, an early decision was made that the survey instrument should be very brief and sent to all institutions rather than to only a sample of them in order to maximize the chance of uncovering an isolated example of a managerial innovation of great promise. Consequently, during April 1970, the Institutional Management Questionnaire was mailed to presidents of each of the 2,537 institutions of higher education listed in the Education Directory, 1968-1969/Part 3, published by the National Center for Educational Statistics, Office of Education, Department of Health, Education and Welfare.

Presidents were selected because the aim of the survey was to determine the capability for managerial effectiveness. It was believed that the president would be the most likely person to know the extent of such a capability, as defined by the three pre-conditions. Furthermore, an essential part of the survey was to determine, from the point of view of the chief campus officer, the most significant administrative change made during recent years. Since presidents are notably short of time, the questionnaire was kept very short. It is reproduced at the end of this chapter.

Reliability of the Response

Usable responses were received from 1,873 (74%) of the schools solicited. Of these, 884 were from the 1,037 public schools listed in the Directory and 989 were from the 1,500 private schools listed. Sixteen public and 27 private schools responded too late for their data to be included in the analysis and 20 private schools replied that for one reason or another they could not answer the questionnaire.

To determine how well the responses represented the schools listed in Part 3 of the Education Directory, they were compared with the American Council on Education report, A Fact Book on Higher Education, third issue, 1969 in which the data used is compiled from the same Education Directory.

When compared with the data from the Fact Book on types of institutional control and highest degree offered, the responses proved to be fairly representative (Charts 10 & 11).

Chart 10 - By Type of Institutional Control

	Total No.	Public	Private
ACE Fact Book	2537	1037(41%)	1500(59%)
Response to Questionnaire	1873	844(47%)	989(53%)

Chart 11 - By Highest Degree Offered

	J.C.	B.A.	M.A.	Ph.D.
ACE Fact Book	867(34%)	833(33%)	509(20%)	278(11%)
Response to Questionnaire	654(35%)	565(30%)	383(20%)	271(14%)

The responses proved equally as representative when compared with the ACE Fact Book data that combined type of institutional control with highest degree offered (Chart 12).

Chart 12 - Highest Degree Offered by Type of Institutional Control

	Public		Private	
	Fact Book	Response	Fact Book	Response
Total N	1015	884	1472	989
J.C.	58%	57%	19%	15%
B.A.	8.9%	8.3%	50%	50%
M.A.	20%	18%	21%	22%
Ph.D.	13%	16%	10%	13%

However, when broken down by percentage of public or private schools by highest degree offered, the response shows an eight percentage point variation from the Fact Book in the category of Junior Colleges (less than a B.A. offered) and a reversal of the percentage figures in the category of Ph.D. The first of these variations can be accounted for by the number of private junior colleges that had gone or were going out of business (unusable responses). The reason for the second variation, the reversal of percentage figures in the category of Ph.D., is unknown. Even so, it should be noted that in the category of Ph.D. the variance of the response from the Fact Book is only five percentage points (Chart 13).

Chart 13 - Highest Degree Offered by Type of Institutional Control (% of total in degree)

	J.C.		B.A.		M.A.		Ph.D.	
	Public	Private	Public	Private	Public	Private	Public	Private
Fact Book: N	597	273	90	743	197	312	134	144
%	69%	31%	11%	89%	39%	61%	48%	52%
Response: N	505	149	73	492	161	222	145	126
%	77%	23%	13%	87%	42%	58%	53%	37%

Regionally, the responses to the questionnaire compared quite favorably with the regional distribution of schools shown in the ACE Fact Book. Only one region, the Far West, showed any appreciable difference and this was a difference of only three percent. In addition, the percentage of responses received from each region, again with the exception of the Far West, was within 10% or less of the total percentage (74%) of responses received (Chart 14).

Chart 14 - Regional Response to Questionnaire

	Fact Book		Response to Questionnaire		
	No. Schools	% of Total Schools	No. Schools	% of Total Schools	% of Schools in State
New England	232	9%	163	9%	70%
Midwest	505	20%	345	18%	69%
Southeast	560	22%	391	21%	70%
Great Lakes	418	17%	314	17%	75%
Plains	285	11%	229	12%	80%
Southwest	174	7%	120	6%	69%
Rocky Mountains	67	3%	55	3%	82%
Far West	288	11%	252	14%	89%
	2529	100%	1869	100%	

The figures in Chart 14 do not include Guam, Canal Zone, Puerto Rico or the Virgin Islands. Only Puerto Rico responded with 4 out of 8 schools.

The response is not, of course, a perfect match to the universe of institutions reported in the 1968-1969 Education Directory of the U.S. Office of Education. The discrepancies, however, appear to be minor, and consequently it is believed that the responses to the questionnaire are representative of the entire population of institutions of higher education. Nevertheless we shall not make any statistical inferences nor make any other claim to the entire universe of institutions, but shall simply deal with that portion represented by the responses received to the questionnaire.

Analysis of the Response

In general the response to the questionnaire was excellent. Letters accompanying the returned questionnaires as well as remarks on the questionnaires themselves showed a widespread interest in the survey. As previously mentioned, 1,873 or 74% of the questionnaires mailed were returned with usable data. Over one half of the responses included some comment about the occurance of significant changes in administrative procedures. Each institution responding was catalogued by type of control (public or private) and then placed in one of 24 categories determined by the size of student body and highest degree offered (Chart 15).

Chart 15 - Categories of Usable Responses

1. Type of Control
   - a) Combined Public and Private Institutions
   - b) Public Institutions only
   - c) Private Institutions only
2. Size of Student Body
   - a) Less than 1,000
   - b) 1,000 to 2,999
   - c) 3,000 to 5,999
   - d) 6,000 to 9,999
   - e) 10,000 to 19,999
   - f) 20,000 and over
3. Highest Degree Offered
   - a) Junior College
   - b) Bachelor's
   - c) Master's
   - d) Doctorate

Tables 1A, 1B, and 1C show the distribution of the responses among the 24 categories. Of the total number of schools responding, 838 or 45% had student bodies of less than 1,000 students and 1,375 schools or 74% had student bodies of less than 3,000 students. By type of control, 24% of the public schools and 63% of the private schools had less than 1,000 students and 55% of the public schools and 90% of the private schools had less than 3,000 students (Chart 16).

Chart 16 - Percent Response by Type of Control and Student Body Size

	Less than 1,000 Students	Less than 3,000 Students
Public School Response	24%	55%
Private School Response	63%	90%
Combined Response	45%	74%

Junior colleges were predominant among the public institutions in both of the above size categories, whereas schools offering the Bachelor's degree were predominant among the private institutions. In one category of private schools (less than 1,000 students/Bachelor's) there were nearly twice as many responses as in any other single category public or private. In the private sector there was a rapid decrease in the number of junior colleges and schools offering the Bachelor's degree as the size of the student body increased beyond 3,000 students. In the public sector this decrease in the number of schools was more gradual. There were three public junior colleges that reported 20,000 or more students.

NUMBER AND PERCENT OF TOTAL RESPONSE B
(N=1873 N$_2$:-JC=654; BA=565, MA=

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000 -	
	JC	BA	MA	PHD	TOT. N$_1$	JC	BA	MA	PHD	TOT. N$_1$	JC	BA	MA	PHD	TOT. N$_1$	JC	BA
N"	309	360	105	64	838	195	184	132	26	537	82	18	84	29	213	38	3
%N	16	19	5.6	3.4	45	10	9.8	7.1	1.4	29	4.4	.96	4.5	1.5	11	2.0	.16
%N$_1$	37	43	13	7.6	100	36	34	25	4.8	100	38	8.4	39	14	100	31	2.4
%N$_2$	47	64	27	24	-	30	32	34	9.6		13	3.2	22	11		5.8	.53

NUMBER AND PERCENT OF PUBLIC RESPONSES B
(N'=884 N'$_2$-JC=505; BA=73; MA=161;

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					600	
	JC	BA	MA	PHD	TOT N"	JC	BA	MA	PHD	TOT N"	JC	BA	MA	PHD	TOT N"	JC	BA
N"'	179	16	7	10	212	181	42	38	10	271	77	13	62	12	164	38	2
%N	9.5	.85	.37	.53	11	9.7	2.2	2.0	.53	14	4.1	.69	3.3	.64	8.8	2.0	.11
%N$_2$	27	2.8	1.8	3.7	-	28	7.4	10	3.7	-	12	2.3	16	4.4	-	5.8	.35
%N'$_1$	20	1.8	.79	1.1	24	20	4.8	4.3	1.1	31	8.7	1.5	7.0	1.4	19	4.3	.23
%N'$_2$	35	22	4.3	6.9		36	58	24	6.9		15	18	38	8.3	-	7.5	2.7
%N"	84	7.5	3.3	4.7	100	67	15	14	3.7	100	47	7.9	38	7.3	100	38	2

NUMBER AND PERCENT OF PRIVATE RESPONSES
(N'=989 N'$_2$:-JC+149; BA=492; MA=2

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					600	
	JC	BA	MA	PHD	TOT N"	JC	BA	MA	PHD	TOT. N"	JC	BA	MA	PHD	TOT. N"	JC	BA
N"'	130	344	98	54	626	14	142	94	16	266	5	5	22	17	49	0	1
%N	6.9	18	5.2	2.9	33	.75	7.6	5.0	.85	14	.27	.27	1.2	.91	2.6		.053
%N$_2$	20	61	26	20	-	2.1	25	25	5.9	-	.77	.89	5.7	6.3	-		.18
%N'	13	35	9.9	5.5	63	1.4	14	9.5	1.6	27	.50	.50	2.2	1.7	5.0		.10
%N'$_2$	87	70	44	43	-	9.4	29	42	13	-	3.3	1.0	10	13			.20
%N"	21	55	16	8.6	100	5.3	53	35	6.0	100	10	10	45	35	100		4.2

RCENT OF TOTAL RESPONSE BY SIZE AND DEGREE
N_2:-JC=654; BA=565, MA=383, PHD=271)

TABLE 1A

00 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
	MA	PHD	TOT. N_1	JC	BA	MA	PHD	TOT. N_1	JC	BA	MA	PHD	TOT. N_1	JC	BA	MA	PHD	TOT. N_1	TOT.ALL N_1
8	84	29	213	38	3	40	43	124	27	0	14	64	105	3	0	8	45	56	1873
6	4.5	1.5	11	2.0	.16	2.1	2.3	6.6	1.4		.77	3.8	5.7	.16		.43	2.4	3.0	100
4	39	14	100	31	2.4	32	35	100	26		13	61	100	5.4		14	80	100	-
2	22	11		5.8	.53	10	16		4.1		3.6	24		.46		2.1	17	-	-

CENT OF PUBLIC RESPONSES BY SIZE AND DEGREE
N'$_2$-JC=505; BA=73; MA=161; PHD=145)

TABLE 1B

00 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
A	MA	PHD	TOT N"	JC	BA	MA	PHD	TOT. N"	JC	BA	MA	PHD	TOT. N"	JC	BA	MA	PHD	TOT. N"	TOT.ALL N'
3	62	12	164	38	2	33	27	100	27	0	13	47	87	3	0	8	39	50	884
9	3.3	.64	8.8	2.0	.11	1.8	1.4	5.3	1.4	-	.69	2.5	4.5	.16		.43	2.0	2.7	46
3	16	4.4	-	5.8	.35	8.4	10	-	4.1		3.4	17	-	.46		2.1	14	-	-
5	7.0	1.4	19	4.3	.23	3.7	3.0	11	3.1		1.5	5.3	9.7	.34		.91	4.4	5.7	100
18	38	8.3	-	7.5	2.7	20	19	-	5.3		8.1	32	-	.59		5.0	27	-	-
.9	38	7.3	100	38	2	33	27	100	31		15	54	100	6.0		16	78	100	-

RCENT OF PRIVATE RESPONSES BY SIZE AND DEGREE
9 N'$_2$:-JC+149; BA=492; MA=222; PHD=126)

TABLE 1C

000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
A	MA	PHD	TOT. N"	JC	BA	MA	PHD	TOT. N"	JC	BA	MA	PHD	TOT N"	JC	BA	MA	PHD	TOT. N"	TOT.ALL N'
5	22	17	49	0	1	7	16	24	0	0	1	17	18	0	0	0	6	6	989
27	1.2	.91	2.6		.053	.37	.85	1.3			.053	.91	.96				.32	.32	53
89	5.7	6.3	-		.18	1.8	5.9				.26	6.3					2.2	-	-
50	2.2	1.7	5.0		.10	.71	1.6	24			.10	1.7	1.8				.61	.61	100
.0	10	13			.20	3.1	13				.44	13					4.3	-	-
10	45	35	100		4.2	29	67	100			5.5	94	100				100	100	-

When responses are examined by highest degree offered, regardless of size, it becomes evident that the schools responding were almost equally divided among three degree categories of Junior College, Bachelor's, and Graduate. The percentage of public and private schools in the two categories of undergraduate and graduate was essentially the same (Chart 17).

Chart 17 - Responses by Degree Offered

	J.C.	B.A.	GRAD.	Undergraduate	Graduate
Public Schools	57%	8.4%	34.7%	65.3%	34.7%
Private Schools	15%	50%	35%	65%	35%
Combined Response	35%	30%	34%	65%	34%

The responding schools were fairly evenly divided by degree category, but not by size of student body. Almost half of the public schools had 3,000 or more students while only one-tenth of the private schools were of an equal size. Therefore, if type of degree alone has the most influence one would expect both public and private schools to show equal use of these scientific management techniques. If the size of student body alone has the most influence on the implementation of scientific management techniques, then it would be expected that a larger percentage of public schools would have institutioanl research, planning-programming-budgeting and computerized information systems.

It is quite possible, of course, that neither size nor highest degree offered have a direct bearing on the implementation of scientific management methods. These questions will be examined in later sections.

Regionally, the responses tended to follow the national response, particularly in the categories of "highest degree offered." The New England region had by far the lowest percentage of schools in the "20,000 or more student body" category and the Plains region had the highest percentage of schools in the "Junior College" (less than B.A.) category (Chart 18).

Chart 18 - Percent of Regional Response by Size of Student Body and by Highest Degree Offered

	Less than 1,000	1,000 2,999	3,000 5,999	6,000 9,999	10,000 19,999	20,000 or more	J.C.	B.A.	M.A.	Ph.D.	Total Schools
New England	51	32	8	4.3	3.7	.61	28	30	29	13	163
Mideast	42	29	15	7.2	3.5	2.9	30	29	22	19	346
Southeast	47	30	10	5.6	5.9	1.5	38	34	15	12	392
Great Lakes	44	26	11	6.0	7.5	5.1	31	35	20	14	314
Plains	61	23	6.5	3.5	3.5	1.7	32	42	17	8.7	229
Southwest	37	31	12	10.0	6.7	4.2	37	22	25	16	120
Rocky Mtn.	38	31	9.1	16.0	1.8	3.6	35	18	22	25	55
Far West	34	26	17	8.2	10	4.7	43	17	24	16	257
Avg. Percent	45	28	12	6.5	5.8	3.0	34	30	21	15	
Nat. Percent	45	29	11	6.6	5.6	3.0	35	30	20	14	

The Questionnaire

The first three questions on the questionnaire (see appendix) serve as indices for categorization. Questions four, five and six were designed to elicit information concerning the administrator's concept of the extent to which the three pre-conditions to scientific management were being used. Under the categories listed above, an analysis was made of the responses to each individual question and of the responses to the group of three questions. This analysis is contained in the sections on Institutional Research, Management Information Systems, Planning-Programming-Budgeting Systems and Effective Management.

Question seven was designed to obtain information concerning significant changes that had taken place in campus administration over the past five years. Administrators at many of the smaller schools, while not expected to have instituted scientific management techniques *per se*, might well have made changes in their administrative procedures or organizational structure that would indicate their awareness of a need for more effective management. It was also hoped to determine the extent to which administrators who replied in the affirmative to the questions on either institutional research, management information systems, or planning-programming-budgeting systems would consider the implementation of these procedures. A summary of the responses to question seven is presented in the section on "Significant Change?"

SECTION II
INSTITUTIONAL RESEARCH

In The Managerial Revolution in Higher Education, Francis E. Rourke and Glenn E. Brooks introduce their chapter on Institutional Research by saying:

> Institutional Research lies at the heart of the trend toward the use of modern management techniques in higher education. While the nature and scope of this kind of activity has tended to elude precise definition in the past, it can be said that institutional research is a varigated form of organizational self-study (emphasis added) designed to help colleges and universities gather an expanding range of information about their own internal operations and the effectiveness with which they are using their resources. By collecting such data, institutions hope to make informed judgements instead of guessing or relying on the intuitions of administrators....[1]

The kinds of decisions needing the information obtained through institutional research vary in magnitude, importance and kind from one institution to another; consequently, there is no general agreement upon either the precise role of such research or its impact upon institutional effectiveness. Institutional research, if it is to be a tool for scientific management, should not be limited to studies and investigations focused upon problems and issues that are basic to long-range planning or that may ultimately have implications for institutional operations.[2] For example, as Lewis B. Mayhew points out, a number of high schools are now offering work at what was considered to be college level only a generation ago.[3] Some colleges, therefore, must seriously question some of their best courses because feeder high schools are already offering courses covering the same material and at about the same level. There is an urgent need, not only for constant self-evaluation of the organization but also for an examination and evaluation of the environment in which it flourishes. As Mayhew says:

> Higher education, like all other forms of education, is a social institution designed to provide services to the society that created it. As times, social needs change, and society asks its institutions to assume new responsibilities. Unless the institution involved does shift to accommodate such new orientations, it loses its viability and effectiveness.[4]

Institutional research may also be used successfully to pose alternative solutions to problems involving the development of student services, facility requirements and the like but there is little evidence of such use. For that matter neither has it reached its full potential for solving academic problems. Institutional research needs greater structure and rational if it is to overcome the inhibitions of academics and be accepted by the collegiate community as a necessary and useful tool.

Joe L. Saupe has defined institutional research as an applied type of research as opposed to the more general research in higher education. He says:

> Institutional research...focuses upon problem of individual institutions. It is true that the problems of individual institutions are often clearly related to, or may even be the same as, the basic problems and fundamental issues which are attacked in the more general research in higher education, and while some are fundamental in themselves, institutional research is not directed at gaining knowledge or solving the general problems of higher education.[5]

As has been suggested, the use of institutional research is as varied as the research itself. Some college presidents use their office of institutional research for the sole purpose of maintaining a data book of facts and figures on the operation of their institution; others pay lip service to the existance of institutional research but do not themselves use the information provided; and others use the institutional research office for the major purpose of answering the flood of questionnaires which appear on every campus. Other campuses conduct a so-called institutioanl research in various schools and departments of the institution, however, unless the results of such studies are conducted and presented from the viewpoint of the institution, and this would seem unlikely, such investigations would hardly supplant a centralized full time office for institutional research.

It is evident that the role and importance of institutional research is not widely understood by college and university administrators. In a recent survey by Donald P. Draine there was a general consensus that institutional research was not needed since the administrators polled believed that they could do whatever research needed to be done as the "need arose." [6] Perhaps they could. But institutional research is basically institution oriented, not dicipline oriented and it is significant that the presidents of the surveyed colleges more readily recognized the need for institutional research than did the other administrators.

As could be expected, the survey also reported that institutional research exhibited diverse characteristics, that is, it was subject to organizational behavior, it was difficult to locate within the organization, it was hard to identify specifically, and its exact role or function in the administration was not easily determined. The typical administrator in the sample survey, perceived himself as competent, as posessing highly adequate knowledge of his institution and his work, and adequate information for the decisions he made. He attributed the same to his colleagues. He was aware of only one constraint--insufficient time to make decisions. It is interesting to note that there was no evidence reported of a correlation in the minds of the administrators between this constraint of time and the usefulness of a centralized office for institutional research.

T. James Perch[7] of Manhattan College conducted a survey of thirty-eight directors of institutional research in four year colleges and universities in New York State. He concluded that:*

> ...the lack of consensus on role definition is an important dimension affecting the development of institutional research as a profession. Since role norms have not been established there is presently no clear professional identity or orientation for directors of institutional research.

Perch also noted that although the increasing complexity of the institution and the growing emphasis on the analysis of institutional data were given as the reasons for starting institutional research, the directors had a very low degree of consensus on the role of institutional research in their organization.

The most extensive survey of institutional research was recently completed by Robert K. Ronny[8] and covered over 175 colleges and universities. The author reported that the most work done by institutional research offices was done on studies that were management related. However, there were again diverse opinions on the role assigned to institutional research in institutions of varying size and type and also among directors having different major fields of study. In general, however, the survey showed that the role of institutional research was generally perceived as moving from the far right and far left, as it were, academic vs management orientations, on a common ground of academic and organizational research. Since this survey included academics as well as administrators it could be assumed, at least in those institutions doing such research, that a generally agreed upon role for institutional research was slowly emerging.

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* From The Role of the Director of Institutional Research in Public and Private Universities and Four Year Colleges in New York State by Dr. T. James Perch. Reprinted by permission of the author.

There remains, however, a lack of commonality among practitioners and users of institutional research and there has been no generalizeable body of knowledge developed which delineates the role, scope and methodology of institutional research. Extensive research in these areas is badly needed. There is an exchange of views through the Association for Institutional Research, and the proceedings of the annual symposia of the Association for Institutional Research provide one of the most extensive discussions of institutional research available.[9] The annual "Annotated Bibliography of Institutional Research" published by the Association is also a valuable source document. However, the vast majority of the research reported is very parochial in nature. The results are of little use to institutional researchers in general except to remind them of studies that they might wish to undertake at their own institutions. Little generalized knowledge is being developed.

The cost effectiveness of institutional research is certainly in question. During a series of interviews conducted by the author, the answer most frequently given to the question "Is institutional research cost effective?" was "Someone must think it is, our budget hasn't been cut!" Is is certainly a paradox when the Institutional Research Office itself is unable to determine its own value. The reason most generally given for this is that the institutional researcher seldom knows whether management decisions were the result of studies conducted by the Institutional Research Office or whether the decisions resulted from studies conducted by someone else.

In reviewing the results of the Institutional Management Questionnaire, the previous comments concerning the multiformity and lack of central focus of institutional research must be kept in mind. No attempt was made to rigidly proscribe the institutional research function except to refer to it as self-study and evaluation. Tables 2A, 2B and 2C show the responses to question 4 of the Institutional Management Questionnaire, "How do you do institutional research (self-study and evaluation)?' The tables are arranged to show the number and percentage of positive responses given by schools in each category to each answer under question 4. For example, consider Table 2A:

1. There were 309 junior colleges having less than 1,000 students. These 309 junior colleges represent 16% of the total number of institutions reporting and 37% of the total number of institutions having less than 1,000 students.

INSTITUTIONAL RESEARCH
NUMBER AND PERCENT OF RESPONSES TO INDIVI
COMBINED PUBLIC AND PRIVATE

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000	
		JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA
	N"	309	360	105	64	838	195	184	132	26	537	82	18	84	29	213	38	3
	%N	16	19	5.6	3.4	45	10	9.8	7.0	1.4	29	4.4	.96	4.5	1.5	11	2.0	.16
	%N'	37	43	13	7.6	45	36	34	25	4.8	29	38	8.4	39	14	11	31	2.4
HAVE IR	4.1	14	35	4	3	56	36	32	37	5	110	30	7	40	8	85	19	1
	%N'	25	63	7.1	5.4	12	33	29	34	4.5	25	35	8.2	47	9.4	19	28	1.4
	%N"	4.5	9.7	3.8	4.7	6.7	18	17	48	19	20	37	39	48	28	40	50	33
CONSORTIUM	4.2	39	45	8	7	99	17	19	11	3	50	5	1	2	1	9	3	-
	%N'	39	45	8.0	7.0	57	34	38	22	6.0	29	56	11	22	11	5.2	33	
	%N"	13	12	7.6	11	12	8.7	10	8.3	12	9.3	6.1	5.6	2.4	3.4	4.2	7.9	
CONSULTANT	4.3	43	103	25	13	184	36	58	30	6	130	13	6	11	7	37	10	1
	%N'	23	56	14	7.1	45	18	45	23	4.6	32	35	16	30	19	9.1	43	4.3
	%N"	13	12	24	20	22	18	31	23	23	24	16	33	13	24	17	26	33
PLAN IR	4.4	4	17	3	4	28	19	13	8	3	43	7	1	13	4	25	2	
	%N'	14	61	11	14	24	44	30	19	7.0	36	28	4.0	52	16	21	22	
	%N"	1.3	4.7	2.9	6.3	3.3	9.7	7.1	6.0	12	8.0	8.5	5.6	15	14	12	5.3	
ADMIN.DO IR	4.5	223	258	81	44	616	142	128	90	18	378	49	12	51	24	136	18	2
	%N'	38	42	13	7.1	49	38	34	24	4.8	30	36	8.8	37	18	11	29	3.2
	%N"	71	72	77	69	74	73	70	68	69	70	60	67	61	83	64	47	66

ITUTIONAL RESEARCH
RESPONSES TO INDIVIDUAL QUESTIONS
PUBLIC AND PRIVATE (N=1873)

TABLE 2A

999		6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
29	213	38	3	40	43	124	27	0	14	64	105	3	0	8	45	56	1873
1.5	11	2.0	.16	2.1	2.3	6.6	1.4	-	.75	3.4	5.6	.16	-	.43	2.4	3.0	
14	11	31	2.4	32	35	6.6	26	-	13	61	5.6	5.4	-	14	80	3.0	100
8	85	19	1	21	28	69	18	-	12	53	83	3	-	5	37	45	448
9.4	19	28	1.4	30	41	15	22	-	14	64	18	6.7	-	10	82	10	100
28	40	50	33	53	65	56	67		86	83	79	100		63	82	80	24
1	9	3	-	5	1	9	1	-		4	5	1			1	2	174
11	5.2	33		56	11	5.2	20			80	2.9	50			50	1.1	100
3.4	4.2	7.9		13	2.3	7.2	3.7			6.3	4.8	33			2.2	3.6	9.3
7	37	10	1	5	7	23	9	-	1	14	24	2			7	9	407
19	9.1	43	4.3	22	30	5.7	37	-	4.2	58	5.9	22			78	2.2	100
24	17	26	33	13	16	18	33		7.2	22	23	66			16	16	22
4	25	2		5	2	9		-	1	7	8			1	4	5	118
16	21	22		56	22	7.6			12	88	6.7			20	80	4.2	100
14	12	5.3		13	4.7	7.2			7.2	11	7.6			12	8.9	8.9	6.3
24	136	18	2	20	23	63	12	-	3	29	44	2		3	15	20	1257
18	11	29	3.2	32	37	50	28		6.8	66	3.5	10		15	75	1.6	100
83	64	47	66	50	54	5.1	43		20	45	42	66		38	33	36	67

INSTITUTIONAL RESE
NUMBER AND PERCENT OF RESPONSES TO I
PUBLIC (N=884)

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999				
		JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'
	N"	179	16	7	10	212	181	42	38	10	271	77	13	62	12	164
	%N	20	1.8	.79	1.1	24	20	4.8	4.3	1.1	31	8.7	1.5	7.0	1.4	19
	%N'	84	7.5	3.3	4.7	24	67	15	14	3.7	31	47	7.9	38	7.3	19
HAVE IR	4.1	8	2	1	1	12	35	11	15	2	63	29	6	32	5	72
	%N'	67	17	8.3	8.3	3.8	56	17	24	3.2	20	40	8.3	44	6.9	23
	%N"	4.5	12	14	10	5.7	19	26	39	20	23	38	46	52	42	44
CONSORTIUM	4.2	21	2		3	26	16	5	5	1	27	5	1	2	1	9
	%N'	81	7.7		12	34	59	19	19	3.7	35	55	11	22	11	12
	%N"	12	12		30	12	8.8	12	13	10	10	6.5	7.7	3.2	8.3	5.5
CONSULTANT	4.3	23	1	2	3	29	33	7	4	3	47	13	3	5	2	23
	%N'	79	3.4	6.9	10	20	70	15	8.5	6.4	33	57	13	22	8.7	16
	%N"	13	6.2	28	30	14	18	17	11	30	17	17	23	8.1	17	14
PLAN IR.	4.4	3		1		4	19	1	2		22	7		12	1	20
	%N'	75		25		6.4	86	4.5	9.1		35	35		60	5.0	32
	%N"	1.7		14		1.9	10	2.4	5.3		8.1	9.1		19	8.3	12
ADMIN. IR	4.5	132	8	4	7	151	132	27	23	7	189	45	10	38	7	100
	%N'	87	53	2.6	4.6	28	70	14	12	3.7	35	45	10	38	7.0	18
	%N"	74	50	57	70	71	73	64	61	70	70	58	77	61	58	61

INSTITUTIONAL RESEARCH
NT OF RESPONSES TO INDIVIDUAL QUESTIONS
PUBLIC (N=884)

TABLE 2B

00 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
A	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT. ALL N'
13	62	12	164	38	2	33	27	100	27	0	13	47	87	3	0	8	39	50	884
.5	7.0	1.4	19	4.3	.23	3.7	3.0	11	3.1	-	1.5	5.3	9.7	.34		91	4.4	5.7	100
7.9	38	7.3	19	38	2	33	27	11	31	-	15	54	9.7	6.0	-	16	78	5.7	100
6	32	5	72	19	1	18	16	54	18		11	42	71	3		5	32	40	312
3.3	44	6.9	23	35	1.8	33	30	17	25		15	59	23	7.5		12	80	13	100
46	52	42	44	50	50	55	59	54	67		85	89	82	100		62	82	80	35
1	2	1	9	3		5	1	9	1			2	3	1			1	2	76
11	22	11	12	33		55	11	12	33			66	3.9	50			50	4.0	100
7.7	3.2	8.3	5.5	7.9		15	3.7	9	3.7			4.3	3.5	33			2.6	1.3	8.6
3	5	2	23	10	1	3	2	16	9		1	9	19	2			6	8	142
13	22	8.7	16	62	6.2	19	12	11	47		5.7	47	13	25			75	5.6	100
23	8.1	17	14	26	50	9.1	7.4	16	33		7.7	19	22	67			15	16	16
	12	1	20	2		4	1	7			1	4	5			1	4	5	63
	60	5.0	32	28		57	14	11			7.7	80	7.9			20	80	7.9	100
	19	8.3	12	5.3		12	3.7	7			20	8.5	5.8			12	10	10	7.1
10	38	7	100	18	1	16	16	51	12		3	18	33	2		3	14	19	543
10	38	7.0	18	35	2.0	31	31	9.4	36		9.1	55	6.1	11		16	74	3.5	100
77	61	58	61	47	50	48	59	51	44		23	38	38	67		37	36	38	61

INSTITUTIONAL RESEARCH
NUMBER AND PERCENT OF RESPONSES TO INDI
PRIVATE (N=989)

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6
		JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'	JC
	N"	130	344	98	54	626	14	142	94	16	266	5	5	22	17	49	0
	%N	13	35	9.9	5.5	63	1.4	14	9.5	1.6	27	.50	.50	2.2	1.7	5.0	
	%N'	21	55	16	8.6	63	5.3	53	35	6.0	27	10	10	45	35	5.0	
HAVE IR	4.1	6	33	3	2	44	1	21	22	3	47	1	1	8	3	13	
	%N'	14	75	6.8	4.5	32	2.1	45	47	6.4	35	7.7	7.7	62	23	9.5	
	%N"	4.6	9.6	3.1	3.7	7.0	7.1	15	23	19	18	20	20	36	18	27	
CONSORTIUM	4.2	18	43	8	4	73	1	14	6	2	23						
	%N'	25	59	11	5.5	74	4.3	61	26	8.2	23						
	%N"	14	12	8.2	7.4	12	7.1	9.8	6.4	12	8.6						
CONSULTANT	4.3	20	102	23	10	155	3	51	26	3	83		3	6	5	14	
	%N'	13	66	15	6.4	64	3.6	62	31	3.6	34		21	43	36	5.8	
	%N"	15	30	23	19	25	21	36	28	19	31		60	27	29	29	
PLAN IR	4.4	1	17	2	4	24		12	6	3	21		1	1	3	5	
	%N'	4.2	71	8.3	17	44		57	28	14	38		20	20	60	9.1	
	%N"	.77	4.9	2.0	7.4	3.8		8.4	6.4	19	7.9		20	4.5	18	10	
ADMIN. IR	4.5	101	250	77	37	465	10	101	67	11	189	4	2	13	17	36	
	%N'	22	54	17	8.0	65	5.3	53	35	5.8	26	11	5.6	36	47	5.0	
	%N"	78	73	78	69	74	71	71	71	69	71	80	40	59	100	73	

INSTITUTIONAL RESEARCH
CENT OF RESPONSES TO INDIVIDUAL QUESTIONS
PRIVATE (N=989)

TABLE 2C

3000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
5	22	17	49	0	1	7	16	24	0	0	1	17	18	0	0	0	6	6	989
50	2.2	1.7	5.0		.10	.71	1.6	2.4			.10	1.7	1.8				.61	.61	100
10	45	35	5.0		4.2	29	67	2.4			5.5	94	1.8				100	.61	100
1	8	3	13			3	12	15			1	11	12				5	5	136
.7	62	23	9.5			20	80	11			8.3	92	8.8				100	3.7	100
20	36	18	27			43	75	62			100	65	72				83	83	14
												2	2						98
												100	2.0						100
												12	11						9.9
3	6	5	14			2	5	7				5	5				1	1	265
21	43	36	5.8			29	71	2.9				100	2.1				100	.41	100
60	27	29	29			29	31	29				29	28				17	17	27
1	1	3	5			1	1	2				3	3						55
20	20	60	9.1			50	50	3.6				100	5.5						100
20	4.5	18	10			14	6.2	8.3				18	17						5.6
2	13	17	36		1	4	7	12				11	11				1	1	714
.6	36	47	5.0		8.3	33	58	1.7				100	1.5				100	.14	100
40	59	100	73		100	57	44	50				65	61				17	17	72

2. Fourteen of the 309 junior colleges with less than 1,000 students reported that they had a full time office for institutional research (4.1). These fourteen junior colleges represent 25% of the 56 institutions having less than 1,000 students and reporting a full time office for institutional research, and 4.5% of the 309 junior colleges reporting.
3. The 56 institutions of less than 1,000 students who reported a full time office for institutional research (4.1) represent 12% of all 448 institutions reporting a full time office for institutional research, and 6.7% of the 838 institutions with less than 1,000 students.

Table 2B and 2C contain similar information for public and private institutions respectively.

Responses to the questionnaire indicate that less than one quarter of the institutions of higher education in the United States have a full time office for institutional research (Table 2A). However, it should be kept in mind that over 24% of the public schools and 63% of the private schools have a student population below 1,000 students. Schools of this size would not be expected to have, nor would they need, a full time office for institutional research. The percentage of schools having a full time office for institutional research rises to 38% when only the schools having 1,000 or more students are considered and to 56% for schools with 3,000 or more students (Chart 19).

Chart 19 - Percentage of Schools Having a Full Time Office for Institutional Research

	All Schools	1,000 to 2,999 Students	3,000 or more Students
Public Schools	35%	45%	59%
Private Schools	14%	25%	46%
Combined	24%	38%	56%

It would seem self-evident that there would be an increased need for a full time office of institutional research as the size of the student body increases. In Table 2A, only 6.7% of the schools having less than 1,000 students have such an office whereas 40% of the schools with 3,000 to 5,999 students and 80% of the schools with 20,000 or more students have full time offices. However, among the public schools this hypothesis does not hold true. As indicated in Table 2B, 82% of the schools in the group having from 10,000 to 19,999 students have a full time office for institutional research while only 80% of the schools in the next larger size category have such an office.

The lack of a full time office for institutional research does not mean that no institutional research is being accomplished. Certainly the use of consultants or the availability of the services of an institutional research office through membership in a consortium is better than nothing. But the use of consultants or membership in a consortium does not and cannot provide the necessary continous self-evaluation required for modern management. Small schools more often report the availability of institutional research through membership in a consortia than do larger schools, as 57% of the schools having such services available have less than 1,000 students (Table 2A). On the other hand, each size category appears to make about equal use of consultants. The percentage of schools employing outside consultants varies from 16% to 24% with little correlation to the size of the student body. In a large number of schools, some 67%, the administrative office purports to do institutional research when it is needed (Chart 20). The question which must be considered is: Can an office or department that has its own parochial point of view be expected to take the dispassionate position essential to effective institutional research?

Chart 20 - Institutional Research (All Institutions)

	Public	Private	Combined
N=	884	989	1873
Have IR Office	35%	14%	24%
IR through Consortia	8.6%	9.9%	9.3%
Use Consultant	16%	27%	22%
Admin. Offices do IR as needed	61%	72%	67%
Planning an IR Office	7.1%	5.6%	6.4%

There does not appear to be much hope for improvement in the near future unless pressures external to the institution force administrators to provide answers to questions which only institutional research can answer. Currently only 7.1% of the public schools and 5.6% of the private schools report plans to estabiish an office for conducting self-study and evaluation (Chart 20). Schools with student bodies of 1,000 to 2,999 represent 36% of this number, which may indicate a growing awareness in smaller schools in this latter category to plan an office of institutional research. Of the schools in this category, 8% are planning an office of institutional research. This figure compares favorably with the percentages in larger size categories. It is considerably larger than the 3.3% of the schools in the category of less than 1,000 students (Table 2A).

The highest degree offered also appears to influence the establishment of an office for institutional research (Chart 21). While the Doctorate is more likely to be offered by a larger school not all schools offering the Doctorate are large. Of the total number of public and private schools awarding the Doctorate, 14% of the public and 55% of the private schools have less than 3,000 students.

Chart 21 - By Highest Level of Instruction - Have IR Office

	Jr. College	Bachelor's	Master's	Doctorate
Public N=	505	73	161	145
Percent having IR Office	22%	27%	50%	69%
Private N=	149	492	222	126
Percent having IR Office	5.4%	11%	17%	29%
TOTAL N=	654	565	383	271
Percent having IR Office	18%	13%	31%	49%

Regionally, the pattern appears much the same although the region in which a school is located appears to have a bearing on the likelihood that the institution will have a full-time office for institutional research (Chart 22).

Chart 22 - Percentage of Schools Having or Planning Full-Time*
Offices of Institutional Research By Region

Region	Number & Percent of Schools Responding	%Having IR	%Planning IR
New England	163(70%)	15%	3.1%
Mideast	346(69%)	25%	8.1%
Southeast	391(70%)	28%	6.1%
Great Lakes	314(75%)	29%	7.6%
Plains	229(80%)	16%	7.4%
Southwest	120(69%)	20%	5.0%
Rocky Mountain	55(82%)	24%	3.6%
Far West	252(89%)	22%	6.3%
National Average	74%	24%	6.5%

This appearance is somewhat misleading. The New England and the Plains regions do have a far smaller percentage of schools with full time offices for institutional research. However, reference to Chart 18 shows that these regions also have a smaller percentage of schools with a student population of 6,000 or more. That is, the schools are generally smaller than the national average. What is significant is that the schools in the Southwest region also have a less than average percentage of schools with a full time office for institutional research and yet this same Southwest region has a far greater than average percentage of schools with 6,000 or more students. Of the states in the Southwest region--Arizona, New Mexico, Oklahoma, Texas--only New Mexico has a higher percentage of schools with offices for institutional research, some 31% as compared to the national average of 24%

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*The region containing the Canal Zone, Puerto Rico, Guam and the Virgin Islands is not included in Chart 22 because of the low response. Only Puerto Rico responded with 4 out of 8 schools.

Since the region in which a state is located may have little or no bearing on the academic, management or special associations to which schools in the state belong, it is not unexpected that the degree to which scientific management methods are implemented cannot be determined by regional locations alone.

It is evident that there has been no universally felt need for a full time office of institutional research. Although there has been a large increase in IR offices since 1950--there were virtually none at that time--over 75% of all of the schools responding still do not have a full time office of institutional research. Furthermore, there are few plans at the present for establishing any considerable number of such offices. There has been no research on the cost-effectiveness of institutional research. Individual studies accomplished by institutional research have proven to be cost-effective but no general body of knowledge has followed from these results. Research needs to be done on what institutional research ought to be and how it could be most effective. Although there is some research on the role and extent of institutional research in colleges and universities the work being done by offices for institutional research is generally that which the individual institutional researcher considers appropriate. What the individual institutional researcher considers appropriate is all too often influenced by his background and academic area of expertise.

SECTION III

MANAGEMENT INFORMATION SYSTEMS

Formal management information systems are essential to institutional research and planning-programming-budgeting systems; except in small institutions, they must be computerized. Little progress has been made toward establishing them. In fact, an administrative member of the State University of New York has said categorically that although many institutions are moving toward a computerized management information system and several have developed very fine pieces of such a system, no one campus or system has a complete MIS other than on the drawing board. These are strong words because some schools believe that they do have management information systems on their campuses and others report that as a member of a consortium the services of such a system are available to them.

Perhaps the problem lies in defining a management information system to everyone's satisfaction. Management information systems, _per se_, are not new since management must by necessity have some form of information available upon which to base decisions. Computerized management information systems, however, are a comparatively recent development. It is known whether the complexities of modern organizations brought about computerized systems or whether the systems permitted modern organizations to attain their current complexity. In either event, it appears that computerized management information systems have become an integral part of most complex business, industrial and governmental organizations.

But what is a management information system? Harold Sacman,[10] a proponent of computer science, defines a management information system as

> an evolving organization of people, computers, and other equipment, including associated communications and support systems, and their integrated operation to regualte and control selected environmental events to achieve systems objectives.

It is understandable that college and university administrators are hesitant about the usefulness of such a system. If, however, a management information system is defined in terms of its purpose, or need, the benefit of such a system becomes more readily apparent. A management information system for an institution of higher education should meet three basic needs:

1. It must provide administrators with information about the day-to-day operations of the university;
2. It must provide the information needed to develop the planning capability required for both long and short term planning by means of analytic techniques;
3. It must provide the reporting capabilities required by the societal and economic pressures for accountability.[11]

Even more simply, management information systems provide for the systematic collection and use of data and for accurate feedback to the administrator of the effects of an institution's current or proposed operations.[12]

Management information systems need not of themselves be complex. It is the extent and diveristy of information required which leads to their complexity. Hence those administrators who believe that they do indeed have management information systems may, from the standpoint of their requirements, be perfectly justified in their belief. But the suspicion remains, nevertheless, than many administrators are satisfied with the information received for the simple reason that they are not aware of the need for more, being content instead to deal with the day-to-day problems as they arise on the basis of personal judgement.

Because of the importance and potential cost of higher education, society is putting increased emphasis on effective planning for the future growth of colleges and universities. As the importance and cost increase there is an irresistable pressure that forces planning and decision-making up the scale of available organizations and, therefore, it is all the more critical that universities participate directly in these operations.[13] But, in order to participate effectively administrators must have information about the operation of their institution--information that only a modern management information system can provide. There is an extensive literature on the planning and design of specific kinds of computer-based business information systems.[14] However, most of such literature was written by computer or information science specialists for other specialists in the field and the mystique generated by such literature has placed the devising of management information systems on the level of theoretical physics. One searches in vain for useful and readily understandable research on the need for and implementation of compter based management information systems in institutions of higher education. It is of little wonder that the college or university administrator, frequently trained in a discipline far removed from administration, has hesitated to intrude in what has become a self-serving dynasty with all the trappings--high priests, journals, and learned societies--of an academic discipline. Nevertheless he must intrude--indeed he must direct--if the knowledge generated by this discipline is to be adapted to his benefit.

Perhaps the reason for the lack of computerized management information systems goes deeper. Certainly there is a generally held belief that one does not wish to become computerized, and management information systems require the systematic collection of all relevant, and frequently what appears to be irrelevant, data. Further, the argument raging among proponents of information systems as to whether a management information system can be built up in bits and pieces or whether it must be approached as a total system--and then only after extensive and costly analysis--has caused administrators to shy away from the matter as from the plague.

Today's college president, however, is the head of an exceedingly complex organization and he must comprehend all of these complexities if he and his institution are to be effective. Certainly he must be prepared to cope with change, for maladaptation to change in the social organism, of which the university is a part, leads to anarchy and chaos. In management hierarchies it leads to the condition where every position is occupied by a person incompetent in his duties.[15] Management information systems alone will not, however, save the college or university president. He must also have some specifically equipped assistants who can cope with the consequences of the fact that even little colleges are today big business, and he must encourage both administrative officers and faculty to give continuous emphasis to long-range planning.[16]

This is not to say that colleges and universities are unaware of the computer. In fact, extensive use is being made of the computer in many institutions of higher education both large and small. But in general its use is limited to the maintenance of records or relieving the burden of student registrations. Such uses are commendable, but the computer is capable of so much more. All too frequently administrators, caught in a "management crisis" must make essential decisions with less than adequate information. Leaders in business, industry and government have demanded that information and computer scientists develop effective management information systems, and this they have done. College and university administrators have yet to make these demands.

Only 13% of the colleges and universities in the United States responded in the affirmative to the question: "Does your institution have a computerized management information system to aid decision making by administrators?" Another 7% reported that the services of a management information system were avialable to them as members of a consortium (Table 3).

When examined by type of control alone, the percentage of private schools having MIS was considerably less than the percentage of public schools having such a system (9% versus 18%, Tables 3B & 3C). This large difference is readily understood however when it is remembered that a large percentage of private schools are small in size. As would be expected, the larger schools have more readily adopted computerized management information systems. In schools of 3,000 or more students, 27% of the public and 30% of the private institutions have MIS. In schools of 6,000 or more students, the percentage of private schools having MIS decreases while the percentage of public schools with MIS continues to rise (Chart 23).

Chart 23 - Percentage of Schools Having MIS by Type of Control and Size

	All Sizes	3,000 or more Students	6,000 or more Students
Public	18%	27%	33%
Private	9%	30%	29%
Combined	13%	28%	32%

Nevertheless in institutions of higher education in general, 864 (46%) of the institutions do not have and do not plan for a computerized management information system. Of these schools, 69% have less than 1,000 students and another 22% have less than 3,000 students (Table 3A). Most certainly the larger schools (3,000 or more students) feel the need for the assistance of a management information system more than do the smaller schools. Forty-six percent of the public schools with no plans for MIS are the schools with less than 1,000 students; 80% of the private schools with no plans for MIS are in the same category (Tables 3B and 3C). But again, size alone is not the sole criterion for the use of management information systems.

The highest degree offered appears to have some impact upon the establishment of a management information system, as is the case with institutional research. The argument previously used for institutional research again prevails, but one must be cautious about subscribing to a causal relationship between degree offered and the implementation of a management information system. Although the percentage of public and private schools having a management information system is approximately equal at the level of the Doctorate, there is considerable variance throughout the remainder of the categories (Chart 24).

COMPUTERIZED MANAGEMENT
NUMBER AND PERCENT OF RESPONSE
COMBINED PUBLIC AND

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999				
		JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'
	N"	309	360	105	64	838	195	184	132	26	537	82	18	84	29	213
	%N	16	19	5.6	3.4	45	10	9.8	7.0	1.4	29	4.4	.96	4.5	1.5	11
	%N'	37	43	13	7.6	45	36	34	25	4.8	29	38	8.4	39	14	11
HAVE MIS	5.1	8	9	1	8	26	33	24	26	3	86	19	4	17	6	46
	%N'	31	35	3.7	31	10	38	28	30	3.5	35	41	8.7	37	13	18
	%N"	2.5	2.5	.95	13	3.1	17	13	20	12	16	23	22	20	21	22
CONSORTIUM	5.2	21	24	4	4	53	14	17	8	3	42	6	3	4	1	14
	%N'	40	45	7.5	6.3	41	33	40	19	7.1	32	43	21	29	7.2	11
	%N"	6.3	6.7	3.8	7.5	6.3	7.2	15	.0	12	7.8	7.3	17	48	3.4	66
PLANS MIS	5.3	55	58	13	10	136	71	65	45	10	191	27	8	37	14	86
	%N'	40	43	9.6	16	25	37	34	24	5.7	35	31	9.3	43	16	16
	%N"	18	16	12	7.4	16	36	35	34	38	35	33	44	44	48	40
NO PLANS	5.4	219	254	84	36	593	66	70	50	8	194	23	3	17	4	47
	%N'	37	43	14	6.1	69	34	36	26	4.1	22	49	6.4	36	8.5	5.5
	%N"	71	71	80	56	71	34	38	38	31	36	28	17	20	14	22

UTERIZED MANAGEMENT INFORMATION SYSTEMS
PERCENT OF RESPONSES TO INDIVIDUAL QUESTIONS
COMBINED PUBLIC AND PRIVATE (N=1873)

TABLE 3A

3000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
18	84	29	213	38	3	40	43	124	27	0	14	64	105	3	0	8	45	56	1873
.96	4.5	1.5	11	2.0	.16	2.1	2.3	6.6	1.4	-	.75	3.4	5.6	.16	-	.43	2.4	3.0	
8.4	39	14	11	31	2.4	32	35	6.6	26	-	13	61	5.6	5.4	-	14	80	3.0	100
4	17	6	46	9	2	15	14	40	8	-	7	19	34	2	-	3	12	17	249
8.7	37	13	18	22	5.0	37	35	16	24		21	56	14	12		18	71	68	100
22	20	21	22	24	66	37	32	32	30		50	30	32	66		38	27	71	13
3	4	1	14	3		1	1	5	11	-	1	3	15		-				129
21	29	7.2	11	60		20	20	3.9	73		6.7	20	12						100
17	48	3.4	66	7.9		2.5	2.3	4.0	41		7.2	4.7	14						6.9
8	37	14	86	13	1	17	25	5.6	10	-	4	37	51	1	-	5	28	34	554
9.3	43	16	16	23	1.8	30	45	10	20		7.8	73	9.2	2.9		15	83	6.1	100
44	44	48	40	34	33	43	58	4.5	37		29	58	49	33		63	62	61	30
3	17	4	47	12		5	2	19	5	-		2	7		-		4	4	864
6.4	36	8.5	5.5	63		26	11	2.2	71			3.1	.81				100	.46	100
17	20	14	22	32		13	4.7	15	19			29	6.7				8.9	7.2	46

COMPUTERIZED MANAGEMENT INFORMATION
NUMBER AND PERCENT OF RESPONSES TO INDIVID
PUBLIC (N=884)

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000	
		JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA
	N"	179	16	7	10	212	181	42	38	10	271	77	13	62	12	164	38	2
	%N	20	1.8	.79	1.1	24	20	4.8	4.3	1.1	31	8.7	1.5	7.0	1.4	19	4.3	.23
	%N'	84	7.5	3.3	4.7	24	67	15	14	3.7	31	47	7.9	38	7.3	19	38	2
HAVE MIS	5.1	6			1	7	31	2	7	1	41	19	2	9	1	31	9	2
	%N'	86			14	4.5	76	4.9	17	2.4	26	61	6.5	29	3.2	20	27	6.1
	%N"	3.3			10	3.3	17	4.8	18	10	15	25	15	15	8.3	19	23	100
CONSORTIUM	5.2	19	1		2	22	14	5	4	1	24	5	3	4	1	13	3	
	%N'	86	4.5		9.1	28	58	21	17	4.2	31	38	23	31	7.7	17	60	
	%N"	11	6.2		20	10	7.7	12	11	10	8.8	6.5	23	6.4	8.3	7.9	34	
PLAN MIS	5.3	35	1	1	2	39	67	16	13	3	99	26	7	27	6	66	13	
	%N'	90	2.6	2.6	5.1	12	68	16	13	3.0	31	39	11	41	9.1	21	32	
	%N"	20	6.2	14	20	18	37	38	34	30	36	34	54	44	50	36	34	
NO PLANS	5.4	114	12	6	2	134	59	16	12	4	91	20	1	14	1	36	12	
	%N'	85	8.9	4.5	1.5	46	65	18	13	4.4	31	56	2.7	39	2.7	12	67	
	%N"	64	75	86	20	63	33	38	32	40	34	26	7.7	23	8.3	22	32	

Y ED MANAGEMENT INFORMATION SYSTEMS
A NT OF RESPONSES TO INDIVIDUAL QUESTIONS
PUBLIC (N=884)

TABLE 3B

-	3000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
M	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
	13	62	12	164	38	2	33	27	100	27	0	13	47	87	3	0	8	39	50	884
3	.5	7.0	1.4	19	4.3	.23	3.7	3.0	11	3.1		1.5	5.3	9.7	.34		.91	4.4	5.7	100
	.9	38	7.3	19	38	2	33	27	11	31		15	54	9.7	6.0		16	78	57	100
	2	9	1	31	9	2	14	8	33	8		6	16	30	2		3	9	14	156
	.5	29	3.2	20	27	6.1	42	24	21	27		20	53	35	14		21	64	9.0	100
	15	15	8.3	19	23	100	42	30	33	30		45	34	20	67		37	23	28	18
	3	4	1	13	3		1	1	5	11		1	2	14						78
	23	31	7.7	17	60		20	20	6.4	79		7.1	14	18						100
3	23	6.4	8.3	7.9	34		3.0	3.7	5	41		7.7	4.3	16						8.8
	7	27	6	66	13		13	15	41	10		4	25	39	1		5	26	32	316
	11	41	9.1	21	32		32	36	13	26		10	64	12	3.1		16	81	10	100
	54	44	50	36	34		39	56	41	37		31	53	45	33		62	67	64	36
	1	14	1	36	12		4	2	18	5			2	7				3	3	289
	.7	39	2.7	12	67		22	11	6.2	71			29	2.4				100	1.0	100
	.7	23	8.3	22	32		12	7.4	18	19			4.3	8.1				7.7	6.0	33

COMPUTERIZED MANAGEMENT INFORMATION SYST
NUMBER AND PERCENT OF RESPONSES TO INDIVIDUAL
PRIVATE (N=989)

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000 - 99		
		JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA
	N'	130	344	98	54	626	14	142	94	16	266	5	5	22	17	49	0	1	7
	%N	13	35	9.9	5.5	63	1.4	14	9.5	1.6	27	.50	50	2.2	1.7	5.0		.10	.71
	%N'	21	55	16	8.6	63	5.3	53	35	6.0	27	10	10	45	35	5.0		4.2	29
HAVE MIS	5.1	2	9	1	7	19	2	22	19	2	45		2	8	5	15			1
	%N'	11	47	5.3	37	20	4.4	49	42	4.4	48		13	53	33	16			14
	%N''	1.5	2.6	1.0	13	3.0	14	16	20	12	17		40	36	29	31			14
CONSORTIUM	5.2	2	23	4	2	31		12	4	2	18	1				1			
	%N'	6.4	74	13	6.4	61		67	22	11	35	100				2.0			
	%N''	1.5	6.7	4.1	3.2	5.0		8.4	4.3	12	6.8	20				2 0			
PLAN MIS	5.3	20	57	12	8	97	4	49	32	7	92	1	1	10	8	20		1	4
	%N'	21	59	12	8.2	41	4.3	53	35	76	39	5.0	5.0	50	40	8.4		6.7	27
	%N''	15	17	12	15	15	28	34	34	44	35	20	20	45	47	41		100	57
NO PLANS	5.4	105	242	78	34	459	7	54	38	4	103	3	2	3	3	11			1
	%N'	23	53	17	7.4	80	6.8	52	37	3.9	18	27	18	27	27	1.9			100
	%N''	81	70	80	63	73	50	38	40	25	39	60	40	14	18	22			14

MANAGEMENT INFORMATION SYSTEMS
OF RESPONSES TO INDIVIDUAL QUESTIONS
, PRIVATE (N=989)

TABLE 3C

5999			6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
22	17	49	0	1	7	16	24	0	0	1	17	18	0	0	0	6	6	989
.2	1.7	5.0		.10	.71	1.6	2.4			.10	1.7	1.8					.61	100
45	35	5.0		4.2	29	67	2.4			5.5	94	1.8					.61	100
8	5	15			1	6	7			1	3	4				3	3	93
53	33	16			14	86	7.5			25	75	4.3				100	3.2	100
36	29	31			14	37	29			100	18	22				50	50	9.4
		1									1	1						51
		2.0									100	2.0						100
		2 0									5.9	5.5						5.2
10	8	20		1	4	10	15				12	12				2	2	238
50	40	8.4		6.7	27	67	6.3				100	5.0				100	.84	100
45	47	41		100	57	63	62				71	67				33	33	24
3	3	11			1		1									1	1	575
27	27	1.9			100		.17									100	17	100
14	18	22			14		42									17	17	58

Chart 24 - Percentage of Schools Having MIS by Highest Degree Offered

	Jr. College	Bachelor's	Master's	Doctorate
Public	15%	8.2%	24%	25%
Private	5.4%	11.0%	17%	29%
Combined	12%	6.9%	18%	25%

Regionally, the use of computerized management information systems compares favorably with the national picture. Again, one area--the New England region--has a smaller percentage of schools using MIS than the national average (8% versus 13%). All other regions equal or exceed the national average. As for institutional research, the reason for this low percentage of schools in the New England region is found in the large percentage of small (less than 3,000 students) schools (Chart 25).

Chart 25 - Percentage of Schools Having Computerized Management Information Systems By Region

	Have MIS	MIS thru Consortia	Plan MIS
New England	8%	5.5%	31%
Mideast	12%	6.6%	34%
Southeast	13%	6.6%	33%
Great Lakes	16%	7.6%	30%
Plains	13%	12%	26%
Southwest	12%	5.0%	33%
Rocky Mountains	20%	5.5%	33%
Far West	13%	9.1%	25%
Nationally	13%	7.6%	25%

Whether or not the schools reporting the use of a computerized management information system did indeed have a complete system in the classical sense is unknown. It is evident that insitutions of higher education have been slow to adopt computerized management information systems as an aid to administrative decision-making. This may be caused by the mysticism surrounding such systems, by the costs of implementations, or by the arguments concerning the feasibility of piecemeal implementations versus waiting for development of a total system.

The Western Interstate Commission for Higher Education (WICHE), Boulder, Colorado, is the leader in the development of large scale management information systems for institutions of higher education. It is conducting seminars for educational administrators on how such systems are developed and is working toward a system which will serve as a model for all institutions of higher education.

The Southern Regional Education Board (SERB) proposed in April, 1970,that the Office of Education fund a project to facilitate regional development of management information systems, regularized higher education data and utilization, and an analytical capacity for regional planning for higher education.

The New England Board of Higher Education is closely allied with WICHE, the SREB and the U.S. Office of Education in an effort to develop and provide access to the management information system being developed by the former agency.

There is a great deal of highly technical literature on the development of computerized management information systems, but for the most part this literature is written by computer or management information scientists for their fellow experts. Such literature is of little use to administrators of small (under 3,000 students) colleges or universities who wish to establish some sort of a MIS. No research has been found on the extent or type of management information system which would be most effective in institutions of higher education, and such research is badly needed.

SECTION IV

PLANNING-PROGRAMMING-BUDGETING SYSTEMS

Midway through the 1960's, an evolutionary approach to administrative planning was introduced throughout most of the Federal Government. First developed, and used with considerable success, by the Department of Defense, this new approach met with initial resistance on the part of other federal departments. Their attempt to follow the procedures of the military department explicitly rather than developing their own processes based upon the *concept* of the new approach led to considerable criticism and travail which is not altogether gone today. Fortunately, however, the conceptual simplicity of the new approach, the planning-programming-budgeting system, is such that it can be beneficially applied, with a judicious eye to local concerns, to almost any form of human endeavor.

Planning-programming-budgeting, or program budgeting as it is frequently called, does not compensate for insufficient resources nor is it a cost reduction procedure *per se*. It does, however, provide a framework upon which to build a rational approach to planning and resource allocation which is a substantial improvement over traditional educational planning and budgeting procedures.

Prior to investing the characteristics of the planning-programming-budgeting system for higher education, it is essential to determine what program budgeting is not. As previously mentioned, it does not provide resources where resources do not exist. The word *programming* in PPBS does not refer to computer programming since the computer, as such, is not essential to PPBS except as an aid to complex calculations or as a reservior for data. PPBS is not simply a new label for the traditional methods of budgeting where the functions were usually expressed in line-item object classes. The word "planning" in PPBS is not the conventional planning where one makes plans for what he would like to do with little rational thought for attainment. Program budgeting is not a cost/benefit analysis which sacrifices goal accomplishment for minimum cost considerations, nor does it require that the entire output of the institution be quantified and measured. Lastly, and perhaps most important of all, the planning-programming-budgeting system is not a pancea for the ills brought on by poor management; it is not a remedy for institutions who cannot hope for the resources necessary to achieve their chosen objectives.[17]

What, then, is planning-programming-budgeting? PPBS itself is only one phase of a new approach to administrative decision-making. In fiscal terms, program budgeting is a way of organizing cost data in such a manner that they can be used to analyze different courses of action in terms of cost and utility. In sharp contrast to conventional budgets, which indicate general categories only and tell little about plans and objectives, program budgets and their associated planning activities indicate specific objectives and methods for their attainment.[18] Hence, the economic rationality of PPBS serves educators by providing a design for the scientific planning and allocation of scarce educational resources among competing ends. Since the emphasis is upon outputs, cost-effectiveness, rational planning, long-range objectives and analytical tools for decision-making, planning-programming-budgeting systems illuminate the relationship between current programs and ultimate objectives. Lest some be put off at this point, it is well to recognize that these are just words which serve to operationalize a concept, and it is in the concept alone that the greatest step forward in administrative planning has occurred.

Perhaps the concept of PPBS can best be illustrated by a short version of Peile and Bunting's example in the ERIC publication, "Program Budgeting and the School Administrator."[19] Let us suppose that you have several jobs to be done around the house. You want a roof fixed, a sand box built, some shelves made, and a fence constructed. Now, you are prepared to spend not more than $550 for these projects, so you call in the local jack of all trades and ask him for an estimate. The next morning Al gives you the following estimate:

Wages:	$300.00
Equip. Rental:	60.00
Equip. Upkeep:	10.00
Materials	430.00
TOTAL	$800.00

You tell Al that this is far too much since you only have $550.00 to spend. Knowing that estimated costs don't really mean anything you expect to be able to argue with Al and get him to lower the wages a little, reduce the equipment needed, stretch the supplies and arrive at your $550.00 figure. Much to your surprise Al calmly informs you that for $550.00 he can:

1. fix the roof, build the sand box and make the shelves, or
2. build the sandbox, make shelves, and construct a fence, or
3. fix the roof and construct the fence.

Totally overwhelmed, you ask Al how he knows this. Al explains that he prepared a program budget for the job and shows you the following:

	Fix Roof	Build Sand Box	Make Shelves	Construct Fence	Total
Wages:	$100.00	$ 50.00	$ 50.00	$100.00	$300.00
Equip. Rental	10.00	20.00	10.00	20.00	60.00
Equip. Upkeep	-0-	5.00	5.00	-0-	10.00
Materials	190.00	70.00	40.00	130.00	430.00
TOTAL	$300.00	$145.00	$105.00	$250.00	$800.00

Al then points out that if he doesn't rent the equipment, and thus save $60.00, his time will be doubled. So to save $60.00 will cost an additional $300.00.

You must make a decision. Weighing all the factors, such as your wife's angry response if you don't put up the shelves, your daughter's disappointment if she doesn't get the sand box, the fact that the fence could be done at a later date, and the knowledge that the rainy season is about to start, you decide to: fix the roof, build a sand box, and make the shelves.

This is program budgeting. If you now make a list of all the things you want done around the house for the next year, and ask Al to prepare a similar cost estimate for all of them, and if you calculate you can spend $50.00 a month, then you can line up the projects in the order in which you most need them and yet stay within your monthly allotment. This is planning-programming-budgeting in its essential concept.

The preceding example of PPBS is, of course, a simplism. Nevertheless it does contain all of the ingredients of far more complex systems, each of which can be reduced to essential techniques not far removed from those illustrated above. There is no single design applicable to all planning-programming-budgeting systems. If it is to be successfull, PPBS must be tailored to the needs of the institution or system of higher education cocerned. In a general sense PPBS is a system for:

1. Planning - the selection or identification of overall, long-range objectives of the college or university and the systematic analyses of various courses of action in terms of relative costs and benefits. These benefits need not be quantitatively measured but may, in fact, be measured by value judgement.

2. Programming - selecting the specific courses of action to be followed in order to reach the objectives.

3. Budgeting - translating planning and programming decisions into specific financial plans, both current and future.

But PPBS is not merely a new technique. Its successful implementation depends upon people. It represents an organization of people and equipment applying technology to the management of an institution. Planning and programming represent the substance of PPBS; budgeting is the mechanism for implementation and control of plans and programs. Planning requires a statement of institutional or program objectives and the development and analysis of alternatives. Programming requires understanding of these courses of action in order to provide specific time schedules, coordination with other programs and identification of resource requirements.[20] Hence, the basic concept of program budgeting is to focus on output or objectives and choose the combination of input resources which best produces or accomplishes that output.

It has long been argued, and rightfully so, that the step from concept to implementation may well be costly to the institution in terms of available time and resources. Certainly PPBS must, as it asks of the programs themselves, pass the test of cost-effectiveness. But higher education is competing for funds as it has seldom had to do before, and institutional spokesmen have not presented carefully developed facts about activities and programs in order to make clear the specific nature of their various financial difficulties. John D. Millet goes to the heart of the matter when he says: "Only a well formulated planning-programming-budgeting system within a university can provide the adequate factual base upon which to evaluate the exact nature of the present financial crisis and upon which to formulate possible alternatives of action."[21]

In contrast the traditional budget presents the institution's financial problems as one whole undifferentiated mass. As Millet goes on to say:

> The administrator's plea is for more income from whatever source...to finance generally everything the university is now doing or may want to do in the future. This is an exceedingly unsophisticated kind of plea. It is a plea, however, which is made inevitable by the absence of a planning-programming-budgeting system within the university.[22]

The great difficulty with most financial information, accurate as it may be, is that it is prepared by accountants for accountants; not by or for administrators. Line-item budgets in their pure form have a limited value for management. Since no cost comparisons or identifiable programs costs are presented management decisions concerning resource allocation are difficult if not impossible to make.

At the same time, institutional objectives are being challenged by the faculty, public and students while institutional effectiveness is being questioned by government agencies, foundations and public doners.[23] Hence, colleges and universities are confronted today with the urgent necessity of developing some form of planning-programming-budgeting system. Perhaps the greatest impact of the PPBS technique, however, is not in the area of solving financial problems. Its greatest impact is in the area of problem formulation: the way administrators think about the problems of the institution.

PLANNING - PROGRAMMING -BUDGETING SYS
NUMBER AND PERCENT OF RESPONSES TO INDIVIDUA
COMBINED PUBLIC AND PRIVATE (N=1

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000 - 9		
		JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA
	N"	309	360	105	64	838	195	184	132	26	537	82	18	84	29	213	38	3	40
	%N	16	19	5.6	3.4	45	10	9.8	7.0	1.4	29	4.4	.96	4.5	1.5	11	2.0	.16	2.1
	%N'	37	43	13	7.6	45	36	34	25	4.8	29	38	8.4	39	14	11	31	2.4	32
HAVE PPBS	6.1	88	89	27	23	227	60	72	45	8	185	30	11	26	8	5	10		15
	%N'	39	39	12	10	39	32	39	24	4.3	32	40	15	35	11	[illegible]	28		40
	%N"	28	25	26	36	27	31	39	34	31	34	37	61	31	28	5	26		37
NO PPBS	6.2	221	271	78	41	611	135	112	87	18	352	52	7	58	21	138	28	3	25
	%N'	36	44	13	6.7	47	38	32	25	5.1	27	38	5.1	42	15	1	32	3.4	29
	%N"	72	75	74	64	73	69	61	66	69	66	64	39	69	72	6	74	100	63

PLANNING - PROGRAMMING - UDGETING SYSTEM
NUMBER AND PERCENT OF RESPONSES TO INDIVIDUAL
PUBLIC (N=884)

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000 - 9		
		JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA
	N"	179	16	7	10	212	181	42	38	10	271	77	13	62	12	16	38	2	33
	%N	20	1.8	.79	1.1	24	20	4.8	4.3	1.1	31	8.7	1.5	7.0	1.4	1	4.3	.23	3.7
	%N'	84	7.5	3.3	4.7	24	67	15	14	3.7	31	47	7.9	38	7.3	1	38	2	33
HAVE PPBS	6.1	52	6		4	62	57	15	11	4	87	27	8	17	3	5	10		12
	%N'	84	9.8		6.4	22	66	17	13	4.6	31	49	15	31	5.4	2	31		37
	%N"	29	37		40	29	31	36	29	40	32	35	62	27	25	3	26		36
NO PPBS	6.2	127	10	7	6	150	124	27	27	6	184	50	5	45	9	10	28	2	21
	%N'	84	6.6	4.6	4.0	25	67	15	15	3.2	68	46	4.6	41	8.2	66	41	29	31
	%N"	71	63	100	60	71	69	64	71	60	30	65	38	73	75	19	74	100	64

NG - PROGRAMMING -BUDGETING SYSTEMS
RCENT OF RESPONSES TO INDIVIDUAL QUESTIONS
MBINED PUBLIC AND PRIVATE (N=1873)

TABLE 4A

3000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT. AL N'
18	84	29	213	38	3	40	43	124	27	0	14	64	105	3	0	8	45	56	1873
.96	4.5	1.5	11	2.0	.16	2.1	2.3	6.6	1.4	-	.75	3.4	5.6	16	-	.43	2.4	3.0	
8.4	39	14	11	31	2.4	32	35	6.6	26	-	13	61	5.6	5.4	-	14	80	3.0	100
11	26	8	75	10		15	12	37	8	-	5	20	33			1	19	20	577
15	35	11	[illegible]	28		40	32	6.4	24		15	61	5.7			5.0	95	3.5	100
61	31	28	35	26		37	28	30	30		36	31	31			12	42	36	31
7	58	21	138	28	3	25	31	87	19	-	9	44	72	3	-	7	26	36	1296
5.1	42	15	11	32	3.4	29	35	6.7	26		12	61	5.5	8.3		19	72	2.8	100
39	69	72	65	74	100	63	72	70	70		64	69	69	100		88	58	64	69

- PROGRAMMING - BUDGETING SYSTEMS
ENT OF RESPONSES TO INDIVIDUAL QUESTIONS
PUBLIC (N=884)

TABLE 4B

3000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT. AL N'
13	62	12	164	38	2	33	27	100	27	0	13	47	87	3	0	8	39	50	884
1.5	7.0	1.4	19	4.3	.23	3.7	3.0	11	3.1		1.5	5.3	9.7	.34		.91	4.4		100
7.9	38	7.3	19	38	2	33	27	11	31		15	54	9.7	5.0		16	78	57	100
8	17	3	55	10		12	10	32	8		5	13	26			1	15	16	278
15	31	5.4	20	31		37	31	12	31		19	50	94			6.2	94	5.8	100
62	27	25	33	26		36	37	32	30		38	28	30			12	38	32	31
5	45	9	109	28	2	21	17	68	19		8	34	61	3		7	24	34	606
4.6	41	8.2	66	41	29	31	25	68	31		13	56	70	8.6		21	71	68	100
38	73	75	18	74	100	64	63	11	70		62	72	10	100		88	62	5.6	69

PLANNING - PROGRAMMING - BUDGETI
NUMBER AND PERCENT OF RESPONSES TO INDI
. PRIVATE (N=989

		LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6	
		JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	B
	N"	130	344	98	54	626	14	142	94	16	266	5	5	22	17	49	0	
	%N	13	35	9.9	5.5	63	1.4	14	9.5	1.6	27	.50	.50	2.2	1.7	5.0		.1
	%N'	21	55	16	8.6	63	5.3	53	35	6.0	27	10	10	45	35	5.0		4.
HAVE PPBS	6.1	36	83	27	19	165	3	57	34	4	98	3	3	9	5	23		
	%N'	22	50	16	12	55	3.1	58	35	4.1	33	15	15	45	25	6.7		
	%N"	28	24	28	35	26	21	40	36	25	37	60	60	41	29	41		
NO PPBS	6.2	94	261	71	35	461	11	85	60	12	168	2	2	13	12	29		
	%N'	20	57	15	7.6	67	6.5	51	36	7.1	24	6.9	6.9	45	41	3.9		5.
	%N"	72	76	72	65	74	79	60	64	75	63	40	40	59	71	59		10

PROGRAMMING - BUDGETING SYSTEMS
T OF RESPONSES TO INDIVIDUAL QUESTIONS
. PRIVATE (N=989)

TABLE 4C

00 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
5	22	17	49	0	1	7	16	24	0	0	1	17	18	0	0	0	6	6	989
0	2.2	1.7	5.0		.10	.71	1.6	2.4			.10	1.7	1.8				.61	.61	100
0	45	35	5.0		4.2	29	67	2.4			5.5	94	1.8				100	.61	100
3	9	5	23			3	2	5				7	7				4	4	299
5	45	25	6.7			60	40	1.7				100	2.3				100	1.3	100
0	41	29	41			43	12	21				41	39				67	67	30
2	13	12	29		1	4	14	19			1	10	11				2	2	400
9	45	41	3.9		5.3	21	74	2.7			9.1	91	1.6				100	.29	100
0	59	71	39		100	57	88	79			100	59	61				33	33	70

than half, some 31%, indicated that PPBS was being used. Surprisingly, almost an equal percentage of public and private institutions responded in the affirmative (Chart 26).

Chart 26 - Percentage of Schools Using PPBS by Type of Control

	Using PPBS
Public	31%
Private	30%
Combined	31%

In contrast to institutional research and management information systems, the size of the student body appears to have little bearing on the implementation of PPBS (Table 4A). The largest schools do have some advantage over the smaller, but between these extremes there is no significant trend. Even when examined by type of school (public or private), no particular trend is evident (Tables 4B and 4C). It is interesting to note, however, the relatively large percentage of schools using PPBS in the 3,000-5,999 student size category among both public and private schools.

Also in contrast to institutional research and management information systems, the highest degree offered appears to have little bearing on the use of PPBS (Chart 27). Public institutions offering the Bachelor's degree had the smallest number of all categories, and public schools reporting also had the highest percentage of PPBS users. When public and private schools are combined, the schools offering the Doctorate had the largest percentage using PPBS, but this did not hold true when the public and private schools were examined individually.

Chart 27 - Percentage of Schools Using PPBS by Highest Degree Offered

	Jr. College	Bachelor's	Master's	Doctorate
Public	31%	40%	29%	34%
Private	28%	29%	33%	32%
Combined	30%	30%	31%	33%

Regionally, there is a considerable variation in the percentage of schools having MIS, ranging from a low of 25% (Southwest and Far West) to a high of 35% (Southeast). There appears to be no relationship to the percentage of schools having IR or MIS in each region (Chart 28).

Chart 28 - Percentage of Schools Using PPBS by Region

	Have PPBS
New England	28%
Midwest	33%
Southeast	35%
Great Lakes	34%
Plains	26%
Southwest	25%
Rocky Mountains	31%
Far West	25%
Nationally	31%

Research into the cost-effectiveness of planning-programming-budgeting systems is singularly lacking. As a result, the decision of whether or not to implement PPBS is primarily dependent upon the subjective opinions of other users. There is a small but growing body of literature pertaining to the adaptation of PPBS to educational systems in general. The administrator must be cautious in his persual, however, lest he be overwhelmed by the myth that scientific management must be complex. Much has been written about the necessity for cost-benefit analysis, analysis of alternative courses of action, the essentiality of measurable outputs and the use of the computer. However, planning-programming-budgeting systems need be no more complicated than the simple example previously illustrated.

There are of course roadblocks to the implementation of any concept which breaks with tradition. The most sensitive and perhaps most aggravating problem encountered in the implementation of PPBS is a human one. The defenses thrown up by members of academia in the face of pressures for innovation and change is common knowledge. Nevertheless, the advantages of the PPBS concept appear to be so logically overwhelming that in time these defenses may be broached. Another and perhaps more serious problem facing most institutions of higher education is the lack of adequate information. Many institutions simply do not know how much it costs to run their programs. They have never taken the time to establish their long-range objectives, and there is a seeming universal reticence to consider viable alternatives.

The basic purpose of planning-programming-budgeting is twofold: 1) to serve as a vehicle for getting better resource management in order to improve the effectiveness of education, and 2) to show the agencies of government, society and the members of the academic community what is being obtained with the resources available. In the last analysis, each institution must make its own decision concerning the use of PPBS. As a system for planning and control, PPBS may be expensive as well as difficult to implement, but as James Farmer goes on to say:

> ...the technology associated with PPBS may significantly improve the art of management by improving insight into the higher education process. For this reason alone, an administrator would be negligent if he did not invest in the time to learn about PPBS and its technology.[24]

SECTION V

EFFECTIVE MANAGEMENT

The responses to individual questions on the Institutional Management Questionnaire provide some indication of the capacity for management effectiveness in institutions of higher education. An even better indicator, however, is provided by the combination of answers reported by each institution. For example, in the preceding sections it was found that 24% of the schools responding had full-time offices for institutional research, 13% had computerized management information systems, and 31% had PPBS. The real question is: How many schools had more than one of these three pre-conditions for effective management?

For this purpose, an analysis was made of the combinational responses returned by each school. Various combinations of responses to questions four, five and six were examined, and the 20 that seemed the most significant were selected for further analysis. These 20 combinations were later reduced to 12 by selecting only those combinations which were chosen by 3% or more of the schools in at least one of the 24 categories. These 12 response combinations included the responses from 1,487 or 79% of the schools reporting. Quite by chance, six of these combinations included answer 4.1 (Have a full time office for institutional research), and six included answer 4.5

(administrators do institutional research when needed). The twelve combinations ranged from the schools that had all three pre-conditions to those that had none (Chart 29).

In Chart 29 the greatest capacity for management effectiveness is indicated by the combination of answer 1-1-1 (Have IR-Have MIS-Have PPBS). While the least capacity for effective management is indicated by answers 5-4-2 (Administrators do IR-No MIS-No PPBS). This latter combination is considered to show the least potential because the efficacy of institutional research accomplished bv various administrative offices is questionable. The remainder of the combinatorial responses are ranked only within the group to which they belong and are not ranked from 1-1-1 to 5-4-2.

Chart 29 - Most Frequently Reported Combinatorial Responses

Last Digit of Answers	4	5	6
1) 1-1-1	Have IR	Have MIS	Have PPBS
2) 1-1-2	Have IR	Have MIS	No PPBS
3) 1-2-2	Have IR	Consortium MIS	No PPBS
4) 1-3-1	Have IR	Plan MIS	Have PPBS
5) 1-3-2	Have IR	Plan MIS	No PPBS
6) 1-4-2	Have IR	No MIS	No PPBS
7) 5-1-1	Admin. do IR	Have MIS	Have PPBS
8) 5-1-2	Admin. do IR	Have MIS	No PPBS
9) 5-3-1	Admin. do IR	Plan MIS	Have PPBS
10) 5-3-2	Admin. do IR	Plan MIS	No PPBS
11) 5-4-1	Admin. do IR	No MIS	Have PPBS
12) 5-4-2	Admin. do IR	No Mis	No PPBS

Only 2.8% of the colleges and universities have a full time office of institutional research, a computerized management information system and a planning-programming-budgeting system as well. Among the public schools 4.2% have all three of these pre-conditions to effective management while a miniscule 1.5% of all private schools gave a similar report (Tables 5A, 5B and 5C). As in the individual responses, however, size is of considerable importance. In schools having a student population of 3,000 or more students, 8% of the combined public and private schools could report an office for institutional research, a computerized management information system and a planning-programming-budgeting system. Eight percent of the public schools and 8.7% of the private schools of a similar size reported the same condition (Chart 30).

Chart 30 - Percentage of Schools Reporting Various Combinations of Answers

	1 - 1 - 1 Have IR Office Have MIS Have PPBS	5 - 1 - 1 Admin. do IR Have MIS Have PPBS
Public all sizes	4.2%	4.5%
Public 3,000 or more students	8.0%	5.0%
Private all sizes	1.5%	3.2%
Private 3,000 or more students	8.7%	8.7%
Combined all sizes	2.8%	3.8%
Combined 3,000 or more students	8.0%	5.6%

Our survey showed 3.8% of the schools have a computerized management information system and a planning-programming-budgeting system, but rather than having a full time office of institutional research, various administrative offices did institutional research when their primary mission required it. (Where schools reported both full-time offices for institutional research and institutional research by administrative offices, the former answer was selected for the combinatorial response.) Again the percentage of schools reporting the combination increased as the size of the school increased (Chart 30).

Institutional research has been called the heart of the trend toward modern management in institutions of higher education, and the combinatorial responses would appear to partially substantiate this belief. Only 2.2% of the responding schools reported that although they had offices for institutional research they had no management information system or planning-programming-budgeting system (Answer 1-4-2 Table 5A). Of these 41 schools, 28 or 3.1% of the public schools and 13 or 1.3% of the private schools gave this combination of answers (Answer 1-4-2 Tables 5B and 5C). On the other hand, in those schools where institutional research was accomplished by various administrative offices, 28% did not have MIS or PPBS (Answer 5-4-2 Table 5A). Of these 524 institutions, 194 or 22% were public schools and 330 or 33% were private schools (Answer 5-4-2 Tables 5B and 5C). It is significant, however, that in each of the above categories the schools with less than 3,000 students were predominant.

The combinatorial responses are particularly susceptable to the size of student body and type of school reporting. In the group of combinations which include full time offices of institutional research, schools of 3,000

COMBINATORIAL
COMBINED PUBLIC AND P

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					
	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC
N"	309	360	105	64	838	195	184	132	26	537	82	18	84	29	213	3
%N	16	.9	5.6	3.4	45	10	9.8	7.0	1.4	29	4.4	.96	4.5	1.5	11	2.
%N'	37	43	13	7.6	45	36	34	25	4.8	29	38	8.4	39	14	11	3
1-1-1		1			1	4	2	5		11	4	2	5		11	
%N'		100			1.9	36	18	45		21	36	18	45		21	2
%N"		.28			.12	2.1	9.8	3.8		2.1	4.9	11	5.9		5.2	5.
1-1-2				1	1	6	2	3		11	3		6		9	
%N'				100	1.7	54	18	27		19	33		66		16	31
%N"				1.6	.12	3.1	1.1	2.3		2.1	3.7		7.1		4.2	11
1-2-2			1		1	1				1	1	1	2	1	5	
%N'			100		11	100				11	20	20	40	7.2	55	
%N"			.95		.12	.51				2.1	1.2	5.6	2.4	3.4	2.3	
1-3-1	3	3			6	4	8	4	2	18	5	1	6	3	13	2
%N'	50	50			9.7	22	44	22	11	29	38	7.2	46	10	21	25
%N"	.97	.83			.72	2.1	4.3	3.0	7.7	3.4	6.1	5.6	7.1	10	6.1	5.3
1-3-2	3	9	1	1	14	11	8	12	2	33	12		15		30	7
%N'	21	64	7.1	7.1	8.9	33	24	36	6.0	21	40		50		19	21
%N"	.97	2.5	.95	1.6	1.7	5.6	4.3	9.1	7.7	6.2	15		18		14	18
1-4-2	5	5	2		12	1	2	6		9	3	1	5		9	3
%N'	42	42	17		29	11	22	67		22	33	11	55		22	50
%N"	1.6	1.4	1.9		1.4	.51	1.1	4.5		1.7	3.7	5.6	5.9		4.2	7.9

COMBINATORIAL RESPONSES
COMBINED PUBLIC AND PRIVATE (N=1873)

TABLE 5A
PAGE 1

3000 - 5999				6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
18	84	29	213	38	3	40	43	124	27	0	14	64	105	3	0	8	45	56	1873
.96	4.5	1.5	11	2.0	.16	2.1	2.3	6.6	1.4		.75	3.4	5.6	.16		.43	2.4	3.0	100
8.4	39	14	11	31	2.4	32	35	6.6	26		13	61	5.6	5.4		14	80	3.0	100
2	5		11	2		5	3	10	5		2	6	13			1	5	6	52
18	45		21	20		50	30	19	38		15	46	25			17	83	12	100
11	5.9		5.2	5.3		12	6.9	8.0	19		14	9.4	24			13	11	11	2.8
	6		9	4	1	4	4	13	1		4	11	16	2		2	4	8	58
	66		16	31	7.7	31	31	22	6.2		25	69	27	25		25	50	14	100
	7.1		4.2	11	33	10	9.3	10	3.7		28	17	15	67		25	8.9	14	3.1
1	2	1	5						1		1		2						9
20	40	7.2	55						50		50		22						100
5.6	2.4	3.4	2.3						3.7		7.1		1.9						.48
1	6	3	13	2		5	1	8	1		2	6	9				8	8	62
7.2	46	10	21	25		62	13	13	11		22	67	15				100	13	100
5.6	7.1	10	6.1	5.3		12	2.3	6.4	3.7		14	9.4	8.6				18	14	3.3
	15		30	7		9	17	33	6		2	21	29	1		2	16	19	158
	50		19	21		27	52	21	21		6.9	72	18	5.2		11	84	12	100
	18		14	18		22	39	26	22		14	33	28	33		25	36	34	8.4
1	5		9	3		1	2	6	3			1	4				1	1	41
11	55		22	50		.7	33	15	75			25	9.8				100	2.4	100
.6	5.9		4.2	7.9		2.5	4.6	4.8	11			1.6	3.8				2.2	1.8	2.2

COMBINATORIAL RESPONSES
COMBINED PUBLIC AND PRIVATE

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000 -		
	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'	JC	BA	M
N"	309	360	105	64	838	195	184	132	26	537	82	18	84	29	213	38	3	4
5-1-1	6	2	1	5	14	13	7	9		29	3	1	4	5	13	2		
%N'	43	14	7.1	35	20	45	24	31		41	23	7.7	31	38	18	20		2
%N"	1.9	.57	.95	7.8	1.7	6.7	3.8	6.8		5.4	3.7	5.6	4.8	17	6.1	5.3		5.
5-1-2	1	4		1	6	10	10	8	1	29	4		2	1	7	2	1	
%N'	17	67		17	12	34	34	28	3.4	57	57		29	14	14	33	17	1
%N"	.32	1.1		1.6	.72	5.1	5.4	6.1	3.8	5.4	4.9		2.4	3.4	3.3	5.3	33	2.
5-3-1	13	12		1	26	14	19	7		40	3	2	8	1	14	1		
%N'	50	46		3.8	30	35	48	17		47	21	14	57	7.1	16	25		5
%N"	4.2	3.3		1.6	3.1	7.2	10	5.3		7.5	3.7	11	9.5	3.4	6.6	2.6		5.
5-3-2	30	25	10	7	72	34	28	17	7	86	9	3	12	11	35	1	1	
%N'	42	35	14	9.7	33	40	33	20	8.1	40	26	8.6	34	31	16	14	14	1
%N"	9.7	6.9	9.5	11	8.6	17	15	13	27	16	11	17	14	3.8	16	2.6	33	2.
5-4-1	40	49	19	11	119	10	11	8	3	32	4			1	5			
%N'	33	41	16	9.2	75	31	34	25	9.4	20	80			20	3.1			10
%N"	13	14	18	17	14	5.1	6.0	6.1	12	6.0	4.9			3.4	2.3			2.
5-4-2	145	147	51	16	359	52	40	26	5	123	13	2	10	4	29	8		
%N'	40	41	14	4.5	68	41	33	21	4.1	.23	45	6.9	34	14	5.5	80		2
%N"	47	41	49	25	43	27	21	20	19	23	16	11	12	14	14	21		5.

COMBINATORIAL RESPONSES
D PUBLIC AND PRIVATE (N=1873)

TABLE 5A
PAGE 2

5999			6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
	29	213	38	3	40	43	124	27	0	14	64	105	3	0	8	45	56	1873
	5	13	2		2	6	10	1		1	1	3				2	2	71
	38	18	20		20	60	14	33		33	33	4.3				100	2.7	100
3	17	6.1	5.3		5.0	14	8.0	3.7		7.1	1.6	2.9				4.4	3.6	3.8
2	1	7	2	1	1	2	6	2				2				1	1	51
9	14	14	33	17	17	33	12	100				3.9				100	2.0	100
4	3.4	3.3	5.3	33	2.5	4.6	4.8	7.4				1.9				2.2	1.8	2.7
3	1	14	1		2	1	4				1	1				1	1	86
7	7.1	16	25		50	25	4.7				100	1.2				100	1.2	100
5	3.4	6.6	2.6		5.0	2.3	3.2				1.6	9.5				2.2	1.8	4.6
2	11	35	1	1	1	4	7	3			8	11			3	2	5	216
4	31	16	14	14	14	57	3.2	27			73	5.1			60	40	2.3	100
4	3.8	16	2.6	33	2.5	9.7	5.6	11			13	1.0			38	4.4	8.9	12
	1	5			1		1	1				1				1	1	159
	20	3.1			100		63	100				.63				100	.63	100
	3.4	2.3			2.5		.80	3.7				9.5				2.2	1.8	8.5
0	4	29	8		2		10	2			1	3						524
4	14	5.5	80		20		1.9	66			33	.53						100
2	14	14	21		5.0		8.0	7.4			1.6	2.9						28

COMBINATORIAL RESP
PUBLIC (N=88

	LESS THAN 1000 STUDENTS					1000 -2999					3000 - 5999					6000	
	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA
N"	179	16	7	10	212	181	42	38	10	271	77	13	62	12	164	38	
%N	20	1.8	.79	1.1	24	20	4.8	4.3	1.1	31	8.7	1.5	7.0	1.4	19	4.3	.2
%N'	84	7.5	3.3	4.7	24	67	15.5	14.0	3.7	31	47	7.9	38	7.3	19	38	
1-1-1						3		2		5	4	1	3		8	2	
%N'						60		40		14	50	12	38		22	22	
%N"						1.7		5.3		1.8	5.2	7.7	4.8		4.9	5.3	
1-1-2						6		2		8	3		4		7	4	
%N'						75		25		17	43		57		15	40	1
%N"						3.3		5.3		2.9	3.9		6.5		4.3	11	5
1-2-2						1				1	1	1	2	1	5		
%N'						100				13	20	20	40	20	63		
%N"						.55				.37	1.3	7.7	3.2	8.3	3.0		
1-3-1	3				3	4	5	1	1	11	5	1	6	1	13	2	
%N'	100				6.1	36	45	9.1	9.1	22	38	7.7	46	7.7	26	29	
%N"	1.7				1.4	2.2	12	2.6	10	4.1	6.5	7.7	9.7	8.3	7.9	5.3	
1-3-2	3		1	1	5	11	4	6	1	22	11		12	3	26	7	
%N'	60		20	20	4.2	50	18	27	4.5	19	42		46	12	22	30	
%N"	1.7		14	10	2.3	6.1	9.5	16	10	8.1	14		19	25	16	18	
1-4-2	1	1			2	1	1	4		6	3	1	5		9	3	
%N'	50	50			7.2	17	17	67		21	33	11	55		32	50	
%N"	.56	6.2			.95	.55	2.4	11		2.2	3.9	7.7	8.1		5.5	7.9	

COMBINATORIAL RESPONSES
PUBLIC (N=884)

TABLE 5B
PAGE 1

- 5999			6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
62	12	164	38	2	33	27	100	27	0	13	47	87	3	0	8	39	50	884
.0	1.4	19	4.3	.23	3.7	3.0	11	3.1		1.5	5.3	9.7	.34		.91	4.4	5.7	100
38	7.3	19	38	2	33	27	11	3.1		15	54	9.7	60		16	78	5.7	100
3		8	2		5	2	9	5		2	4	11			1	3	4	37
38		22	22		56	22	24	45		18	36	30			25	75	11	100
.8		4.9	5.3		15	7.4	9.0	19		15	8.5	12			12	7.7	8	4.2
4		7	4	1	4	1	10	1		3	10	14	2		2	3	7	46
57		15	40	10	40	10	22	7.1		21	71	30	29		29	43	15	100
.5		4.3	11	50	12	3.7	10	3.7		23	21	16	67		25	7.7	14	5.2
2	1	5						1		1		2						8
40	20	63						50		50		25						100
2	8.3	3.0						3.7		7.8		2.3						.9
6	1	13	2		4	1	7	1		2	5	8				7	7	49
6	7.7	26	29		57	14	14	12		25	63	16				100	14	100
7	8.3	7.9	5.3		12	3.7	7	3.7		15	11	9.2				18	14	5.5
2	3	26	7		7	9	23	6		2	16	24	1		2	15	18	118
6	12	22	30		30	39	19	25		8.3	67	20	5.5		11	83	13	100
9	25	16	18		21	33	23	22		15	34	28	33		25	38	36	13
5		9	3		1	2	6	3			1	4				1	1	28
5		32	50		17	33	21	75			25	14				100	3.6	100
1		5.5	7.9		3	7.4	6	11			2.1	4.6				2.6	2	3.1

COMBINATORIAL RESPO
PUBLIC (N=884

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6000	
	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'	JC	BA
N"	179	16	7	10	212	181	42	38	10	271	77	13	62	12	164	38	2
5-1-1	4				4	13		3		16	3	1	2	1	7	2	
%N'	100				10	81		19		40	43	14	29	14	18	25	
%N"	2.2				1.9	7.2		7.9		5.9	3.9	7.7	3.2	8.3	4.3	5.3	
5-1-2	1				1	10	2			12	4				4	2	1
%N'	100				4.0	83	17			48	100				16	40	20
%N"	.56				.47	5.5	4.8			4.4	5.2				2.9	5.3	50
5-3-1	5	1			6	14	3	2		19	3	2	4		9	1	
%N'	83	17			16	74	16	10		50	33	22	44		24	33	
%N"	2.8	6.2			2.8	7.7	7.1	5.3		7	3.9	15	6.5		5.5	2.6	
5-3-2	23			2	25	32	5	4	2	43	9	3	9	3	24	1	
%N'	92			8.0	23	74	12	9.3	4.6	39	37	13	37	13	22	20	
%N"	13			20	12	18	12	11	20	16	12	9.1	15	25	15	2.6	
5-4-1	23			1	24	9	2	1	2	14	2			1	3		
%N'	96			4.1	56	64	14	7.1	14	33	67			33	7.0		
%N"	13			10	11	5	4.8	2.6	20	5.2	2.6			8.3	1.8		
5-4-2	81	6	5	1	93	46	11	6	3	66	13		8	1	22	8	
%N'	87	6.4	5.4	1.1	48	70	17	9.1	4.5	34	59		36	4.5	11	80	
%N"	45	37	71	10	44	25	26	16	30	24	17		13	8.3	13	21	

COMBINATORIAL RESPONSES
PUBLIC (N=884)

TABLE 5B
PAGE 2

	3000 - 5999					6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
T. '	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.AIL N'
71	77	13	62	12	164	38	2	33	27	100	27	0	13	47	87	3	0	8	39	50	884
16	3	1	2	1	7	2		1	5	8	1		1	1	3				2	2	40
0	43	14	29	14	18	25		12	63	20	33		33	33	7.5				100	5.0	100
9	3.9	7.7	3.2	8.3	4.3	5.3		3	19	8	3.7		7.8	2.1	3.4				5.1	4	4.5
2	4				4	2	1	1	1	5	2				2				1	1	25
8	100				16	40	20	20	20	20	100				8.0				100	4.0	100
4	5.2				2.9	5.3	50	3	3.7	5	7.4				2.3				2.6	2	2.8
9	3	2	4		9	1		1	1	3									1	1	38
0	33	22	44		24	33		33	33	7.9									100	2.6	100
7	3.9	15	6.5		5.5	2.6		3	3.7	3									2.6	2	4.3
3	9	3	9	3	24	1		1	3	5	3			4	7			3	2	5	109
9	37	13	37	13	22	20		20	60	4.6	43			57	6.4			60	40	4.6	100
6	12	9.1	15	25	15	2.6		3	11	5	11			8.5	8.1			38	5.1	10	1.2
4	2			1	3			1		1	1				1						43
3	67			33	7.0			100		2.3	100				2.3						100
2	2.6			8.3	1.8			3		10	3.7				1.1						4.9
6	13		8	1	22	8		2		10	2			1	3						194
4	59		36	4.5	11	80		20		5.2	66			33	1.5						100
4	17		13	8.3	13	21		6.1		10	7.4			2.1	3.4						22

COMBINATO
PRIVA

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999				
	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT N'
N"	130	344	98	54	626	14	142	94	16	266	5	5	22	17	49
%N	13	35	9.9	5.5	63	1.4	14	9.5	1.6	27	.50	.50	2.2	1.7	5.0
%N'	21	55	16	8.6	63	5.3	53	35	60	27	10	10	45	35	5.0
1-1-1		1			1	1	2	3		6		1	2		3
%N'		100			6.7	17	33	50		40		33	66		20
%N"		29			.16	7.1	1.4	3.2		2.3		20	9.1		6.4
1-1-2				1	1		2	1		3			2		2
%N'				100	8.3		66	33		25			100		17
%N"				1.8	.16		1.4	1.1		1.1			9.1		4.1
1-2-2			1		1										
%N'			100		100										
%N"			1.0		.16										
1-3-1			3		3		3	3	1	7					
%N'			100		23		43	43	14	54					
%N"			.87		.48		2.1	3.2	6.2	2.6					
1-3-2		9			9		4	6	1	11	1		3		4
%N'		100			23		36	55	9.1	27	25		75		10
%N"		2.6			1.4		2.8	6.4	6.2	4.1	20		14		8.2
1-4-2	4	4	2		10		1	2		3					
%N'	40	40	20		77		33	66		23					
%N"	3.2	1.2	2.0		1.6		.70	2.1		1.1					

COMBINATORIAL RESPONSES
PRIVATE (N=989)

TABLE 5C
PAGE 1

3000 - 5999					6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
C	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	TOT.ALL N'
5	5	22	17	49	0	1	7	16	24	0	0	1	17	18	0	0	0	6	6	989
50	.50	2.2	1.7	5.0		.10	.71	1.6	2.4			.10	1.7	1.8				.61	.61	100
10	10	45	35	5.0		2	29	67	2.4			5.5	94	1.8				100	.61	100
	1	2		3				1	1				2	2				2	2	15
	33	66		20				100	6.7				100	13				100	13	100
	20	9.1		6.4				6.2	4.2				12	11				33	33	1.5
		2		2				3	3			1	1	2				1	.1	12
		100		17				100	25			50	50	17				100	8.3	100
		9.1		4.1				19	12			100	5.9	11				17	17	1.2
																				1
																				100
																				.10
							1		1				1	1				1	1	13
							100		7.7				100	7.7				100	7.7	100
							14		4.2				5.9	5.5				17	17	1.3
1		3		4			2	8	10				5	5				1	1	40
5		75		10			20	80	25				100	12				100	2.5	100
0		14		8.2			28	50	42				29	28				17	17	4.1
																				13
																				100
																				1.3

COMBINATORIAL RESP
PRIVATE (N=98

	LESS THAN 1000 STUDENTS					1000 - 2999					3000 - 5999					6
	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'	JC
N''	130	344	98	54	626	14	142	94	16	266	5	5	22	17	49	0
5-1-1	2	2	1	5	10		7	6		13			2	4	6	
%N'	20	20	10	50	32		54	46		42			33	66	19	
%N''	1.5	.58	1.0	9.3	1.6		4.8	6.4		4.9			9.1	23	12	
5-1-2		4		1	5		8	8	1	17			2	1	3	
%N'		80		20	19		47	47	5.9	65			66	33	12	
%N''		1.2		1.8	18		5.6	8.5	6.2	6.4			9.1	5.9	6.1	
5-3-1	8	11		1	20		16	5		21			4	1	5	
%N'	40	55		5.0	42		76	24		44			80	20	10	
%N''	6.1	3.2		1.8	3.2		11	5.3		7.9			18	5.9	10	
5-3-2	7	25	10	5	47	2	23	13	5	43			3	8	11	
%N'	15	53	21	10	44	4.7	63	30	12	40			27	73	10	
%N''	5.4	7.3	10	9.3	7.5	14	16	14	31	16			14	47	22	
5-4-1	17	49	19	10	95	1	9	7	1	18	2				2	
%N'	18	52	20	10	82	5.5	50	39	5.5	16	100				1.7	
%N''	13	14	19	18	15	7.1	6.3	7.4	6.2	6.8	40				4.1	
5-4-2	64	141	46	15	266	6	29	20	2	57		2	2	3	7	
%N'	24	53	17	5.6	81	11	51	35	3.5	17		29	29	43	2.1	
%N''	49	41	47	28	42	43	20	21	13	22		40	9.1	18	14	

COMBINATORIAL RESPONSES
PRIVATE (N=989)

TABLE 5C
PAGE 2

3000 - 5999					6000 - 9999					10000 - 19999					20000 OR MORE STUDENTS					
JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N'	JC	BA	MA	PHD	TOT N'	JC	BA	MA	PHD	TOT. N	TOT.ALL N'
5	5	22	17	49	0	1	7	16	24	0	0	1	17	18	0	0	0	6	6	989
		2	4	6			1	1	2											31
		33	66	19			50	50	6.4											100
		9.1	23	12			14	6.2	5											3.1
		2	1	3				1	1											26
		66	33	12				100	3.8											100
		9.1	5.9	6.1				6.2	4.2											2.6
		4	1	5			1		1				1	1						48
		80	20	10			100		2.1				100	2.1						100
		18	5.9	10			14		4.2				5.9	5.5						4.9
		3	8	11		1		1	2				4	4						107
		27	73	10		50		50	1.9				100	3.7						100
		14	47	22		100		6.2	8.3				24	22						11
2				2														1	1	116
100				1.7														100	.86	100
40				4.1														17	17	12
	2	2	3	7																330
	29	29	43	2.1																100
	40	9.1	18	14																33

or more students reported these combinations a much larger percentage of the time than did schools with less than 3,000 students. Conversely, in the group of combinatorial response where institutional research was accomplished by various administrative offices, the schools with less than 3,000 students predominate. However, when the response from public and private schools are examined separately it is found that there is a reversal of this trend in the private schools. Regardless of the manner in which institutional research is performed, the schools with less than 3,000 students reported the combination a larger percentage of the time than did the private schools of 3,000 students or more (Chart 31).

Chart 31 - Percentage of Schools Having Either an IR Office Or Having Administrators do IR

	Have IR Office		Administrators do IR	
	3,000 or more Students	Less than 3,000 Students	3,000 or more Students	Less than 3,000 Students
Public	68%	22%	27%	72%
Private	42%	58%	6.4%	93%
Combined	72%	28%	17%	83%

Three combinations of answers are of particular significance because they provide some insight into the true nature of the planning-programming-budgeting system being used. As previously mentioned, PPBS need not be complex. But it is a fact of life that large, complex organizations will have large, complex planning-programming-budgeting systems. The required storage and retrieval alone requires the services of a computer, and the data generation and analysis that is an essential part of PPBS cannot be accomplished without a computerized management information system. Of the schools responding, 307 (16%) reported that they: 1) had some form of institutional research, 2) currently had no computerized management information system, and 3) had a planning-programming-budgeting system (answers 1-3-1, 5-3-1, and 5-4-1, Chart 29).

In schools having less than 3,000 students, it is quite possible that the simplicity of their operation would permit the development of a PPBS using only manually manipulated data. It is possible but not probable that the same thing could be accomplished in schools having from 3,000 to 6,000 students. But it is highly improbable and likely impossible for schools with a student body of 6,000 or more students to have an effective planning-programming-budgeting system without a computerized management information system. It is inconceivable that such could be the case in a school having a student enrollment of 10,000 or more. Yet, 34 schools with a student population of 6,000 or more students purport to have a planning-programming-budgeting system without the use of a management information system (Chart 32). True, 31 of these schools (with 6,000 or more students) are planning to install a management information system, but whether this resulted from the prior development of a PPBS is unknown.

Chart 32 - Number of Schools Reporting PPBS but no MIS (N=307)

	1-3-1 Have IR Plan MIS Have PPBS	5-3-1 Admin. do IR Plan MIS Have PPBS	5-4-1 Admin. do IR No MIS Have PPBS	TOTAL
Less than 3,000 Students	7.3%	21%	49%	78%
3,000-5,999 Students	4.2%	4.6%	1.6%	11%
6,000-9,999 Students	2.6%	1.3%	.3%	4.2%
10,000 or more	5.5%	.6%	.6%	6.8%
TOTAL	20%	28%	52%	100%

SECTION VI

SIGNIFICANT CHANGE

The combinatorial responses to the Institutional Management Questionnaire provide a deeper insight into the capacity of institutions to attain managerial effectiveness than do the individual responses alone. However, while insitutional research, computerized management information systems and planning-programming-budgeting systems are essential pre-conditions of effective management, other significant changes are also being made. Question 7 on the Institutional Management Questionnaire was included in order to permit the chief campus officers to voice their personal opinions about the significant changes which had occured in their administrations during the past five years. Well over half of the returned questionnaires contained some discussion of significant change. Responses ranged from "none" to descriptions of complex reorganizations. For the most part, however, the responses could be classified as organizational structure changes, procedural changes, or technological changes.

The installation and use of a computer was mentioned most often. In a cross-sectional spot check of 193 schools that had responded to question 7, 43 (22%) indicated that they had recently computerized admissions records, financial records, and so forth or that they had recently aquired a computer and were commencing to computerize all records. In conjunction with computer use, sixteen additional responses indicated that the development of a management information system was the school's most significant administrative change. These responses were not necessarily mutually exclusive, as some schools list both.

The second most often mentioned change was the implementation of long-range plans for the organization of a planning group. Twenty-four schools included this response. While in a similar vein, 22 schools considered the reorganization of their corporate structure to be their most significant change. In conjunction with this, eight additional schools spoke of newly hired personnel, seven more selected the delegation of authority and responsibility and eight considered the implementation of a full time office for institutional research to be the most significant.

The streamlining of procedures and the improvement of communications were mentioned by 12 of the 193 schools. Ten other responses mentioned specifically greater faculty participation and eight spoke of greater student participation. Again, these responses were not mutually exclusive, since some defined better communications as the inclusion of faculty and students in the decision-making process.

Twenty-one administrators considered the streamlining, reorientation, or computerizing of their budgetary procedures the most significant change in their administrative procedures. Ten more considered the establishment of a planning-programming-budgeting system to be the most significant.

Evidently change and innovation is taking place, although the success of such changes, as the responses indicated, may not be known for some time. The changes were about evenly divided among organizational structure changes, procedural changes and technological changes, although there was considerable overlap among all three. Certainly those administrators who considered institutional research, management information systems or planning-programming-budgeting systems to be their most significant change are well aware of the need for change.

Whether these changes will bring about even more significant changes is unknown. Increased student and faculty participation in institutional administration will most certainly cause other changes to be made. Whether these changes will increase the effectiveness of institutional management is a question the future must answer.

APPENDIX

INSTITUTIONAL MANAGEMENT QUESTIONNAIRE

NAME OF INSTITUTION:______________________________________DATE:__________

1.0 TYPE OF INSTITUTION. PLEASE CIRCLE TWO IF APPROPRIATE:

1.0 PUBLIC 1.2 PRIVATE 1.3 PART OF A MULTICAMPUS SYSTEM 1.4 OTHER________

2.0 HIGHEST DEGREES OFFERED. PLEASE CIRCLE ONE:

2.1 A.A. (JR. COLLEGE) 2.2 BACHELORS 2.3 MASTERS 2.4 DOCTORATE

3.0 SIZE OF STUDENT BODY. PLEASE CIRCLE ONE:

3.1 UNDER 1,000 3.2 1,000 TO 2,999 3.3 3,000 TO 5,999
3.4 6,000 TO 9,999 3.5 10,000 TO 19,000 3.6 20,000 OR MORE

4.0 HOW DO YOU DO INSTITUTIONAL RESEARCH - SELF STUDY AND EVALUATION? PLEASE CIRCLE ONE OR MORE:

4.1 WE HAVE A FULL TIME OFFICE CALLED______________________________
4.2 AS A MEMBER OF A CONSORTIUM, WE HAVE SUCH SERVICES AVAILABLE.
4.3 WE PERIODICALLY EMPLOY AN OUTSIDE CONSULTANT.
4.4 WE PLAN TO ESTABLISH AN OFFICE FOR THIS PURPOSE CALLED__________________
4.5 VARIOUS ADMINISTRATIVE OFFICES DO SUCH RESEARCH WHEN THEIR PRIMARY MISSION REQUIRES IT.
4.6 OTHER____

5.0 DOES YOUR INSTITUTION HAVE A COMPUTERIZED MANAGEMENT INFORMATION SYSTEM TO AID DECISION-MAKING BY ADMINISTRATORS? PLEASE CIRCLE ONE:

5.1 YES, ON THIS CAMPUS 5.2 YES, AS A MEMBER OF A CONSORTIUM OR MANAGEMENT SYSTEM.
5.3 NO, BUT WE ARE PLANNING ONE. 5.4 NO, AND WE HAVE NO PLANS FOR ONE.
5.5 OTHER____

6.0 DO YOU USE A FORMAL PLANNING-PROGRAMMING-BUDGETING SYSTEM TO AID IN ANALYZING INSTITUTIONAL GOALS OR OBJECTIVES, EVALUATING ALTERNATIVE COURSES OF ACTION, JUSTIFYING FUTURE AND CURRENT PROGRAMS, OR DETERMINING THE NEED FOR AND ALLOCATION OF RESOURCES?

6.1 YES 6.2 NO.

7.0 PLEASE SPECIFY BELOW THE MOST SIGNIFICANT IMPROVEMENT THAT HAS BEEN MADE IN YOUR ADMINISTRATIVE PROCEDURES DURING THE PAST FIVE YEARS.

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CHAPTER 22

CAN MATHEMATICAL MODELS CONTRIBUTE TO EFFICIENCY IN HIGHER EDUCATION?

In an era of close public scrutiny, the American college or university faces the tasks of improving and demonstrating managerial efficiency. Management techniques in such institutions are often outmoded; operations research techniques have had a lesser impact on academic management than on the management of defense related industries, oil companies or timber companies, for example. A recent survey[1] has shown that only 22% of American colleges and universities have an office of institutional research--an organization concerned with developing information for wise management of the institution.

However, in recent years, management science techniques have played a greater role in academia. The same survey indicates that 31% of American colleges use some form of Planning-Programming-Budgeting System (PPBS). Large scale simulations have been used to study the total operation of a university[2,3,4] and operations research techniques have been applied to the prediction of future institutional characteristics such as the student body mix by educational level[5] or the faculty mix by rank.[6,7]

In this review we shall attempt to assess the importance of these previous efforts and suggest directions for future pursuits. Some of our comments on the drawbacks of these efforts will seem trite since such drawbacks are inevitable in any application of management science technology. However, the faults are there and must be dealt with. Some of the advantages will seem obvious too, but they must be enumerated in any attempt to evaluate past efforts.

A number of large scale mathematical models of institutions of higher education have been constructed. They are elaborate calculating procedures which enable administrators to estimate, using simple assumptions about growth of the student body, the numbers of majors there will be in different departments, the numbers of new faculty members that will be needed at different ranks, the numbers of the new classrooms and laboratories that will be needed, and so on. The main work of constructing such a model is determination of a large number, literally thousands, of percentages using past data about student flows. Thus, the model requires the percentages of freshmen in various departments that bust out in the first semester, in the second semester, that drop out never to return, that drop out and return later, that return for their sophomore year, that decide to change majors in their first year and the percentages of those that select the various options for new majors. One needs similar percentages for other categories of students--sophomores, juniors, seniors, graduate students, transferees, returnees. Given the number of majors in a given department one needs the percentages that will take the various courses, that will minor in other departments and take what courses there, that will take what courses in still other departments, and so on. Then one needs percentage distributions of various demands of categories of users for various kinds of facilities. Finally there is a host of percentages needed about utilization of faculty at various levels, of staff support for them at the departmental level, of libraries, of higher administration support, and of services for health, finance, records of grades and credits, athletics, student employment, student loans, food, housing, etc. The fundamental object is to come out at the end with course enrollments so that one can calculate needed staff, services, and facilities. The whole thing is programmed for a computer so that the calculations can be done rapidly.

With such a model university administrators can explore the financial and other implications of various growth policies, various admission policies, various personnel policies. The model is a tool for assisting administrators to operate the institution more efficiently. This chapter examines some of these tools but it does so in rather technical terms because such terms are necessary to give an accurate description of what the models do and how they differ.

The general conclusion of the examination is that these models can be of limited use but since it is an expensive task to create a large detailed model it would probably be advisable to keep the amount of detail down and simply deal with fairly large aggregations of students, staff and facilities. The reason the models are of limited use is that critical events outside the university influence the flows of students far more than the percentages derived from past flows. For example, the federal guaranteed student loan program upset all projections of enrollment growth. So did the military draft for the war in Vietnam. Militancy on certain campuses has influenced students' intent to go to them. The recent widespread unemployment of aerospace engineers has caused a large shift of students from physical science majors to biological science majors; they hope environmental management will be a growing field. The recruitment of minority students to the campus has created a bulge in demands for social sciences and for new courses and curricula related to urban and minority problems. Events of this kind tend to throw projections based on percentages badly off.

To put it a little differently, there is no escaping a large element of uncertainty in any projections that are calculated by hard and fast models. The fact that the projections are numerical and came about by an undeniably correct numerical process unfortunately creates an illusion of certainty which simple arithmetic models cannot possibly provide. When they are used, therefore, they should always be embedded in some more comprehensive decision-under-uncertainty model whose calculated outputs are in a form that make it quite clear that they are fuzzy; in that kind of context it will also be clear that any detail smaller than the margin of fuzziness is ridiculous.

More generally, we doubt that the techniques of management science can make a large contribution to unearthing opportunities for large increases in efficiency in higher education. Or perhaps it would be fairer to say that opportunities for achieving large increases do not appear to need the precision of these techniques to become noticeable. On the other hand, the techniques can help improve efficiency and should be used; higher education is a large enough enterprise that modest improvements are well worth making.

In Section I of the remainder of this chapter we shall concentrate on large scale simulations and later turn in Section II to less ambitious efforts.

SECTION I

SIMULATIONS AND EDUCATIONAL INSTITUTIONS

Simulation is a popular and powerful modeling tool. With the assistance of a computer to assure computational feasibility, simulation models can be built to forecast the future behavior of an existing system. The predictions often cover a span of years while the necessary computations require minutes of computer time and weeks of labor.

It is convenient to list four purposes of simulation which are common to most applications:

1. To provide an extrapolation into the future. The behavior of an existing system operating under known policies can be simulated to predict future system characteristics. For example, one could quantify current undergraduate admission policies by subject field, could extrapolate from current data on student flow and could make predictions of, say, the number of sophomore social science majors in the system five years from now.
2. To provide an experimental tool for forecasting the implications of a variety of policy parameter values. With the above model one could assess the effects of proposed alternative policies, e.g., several different admissions quota levels for social science majors.
3. To provide impetus for "rational" thought about cause and effect relationships. The construction of a model requires careful consideration of the system structure. These demands might lead to new insights for the decision-maker.

4. To provide a computational mechanism for measures of system performance which would otherwise be difficult to calculate. For example, the cost of providing educational services to a sophomore student in social sciences could be estimated.

While a simulation model can offer these four types of advice, it is important that the advice be worth the cost of preparing it.

In simulation of educational institutions the primary purpose is to provide guidance about future resource needs--faculty, physical plant, and supporting activities (e.g., university administration, student health service). A mathematical model is used to express the relationship between available university resources and production of educated manpower. Such a model is typically constructed of four phases:

1. Estimation of future student body mix by age (or length of stay in the university) and major (or more broad field, e.g., physical sciences). Simplifying assumptions on student flow are necessary for computational feasibility; Markov Chain techniques are the most common. From this phase emerges a set of statements such as "in 1976 there will be 2,500 sophomore social science majors;" these data are the inputs to phase 2.
2. Computation of demand for individual courses. Using past data on courses taken by students of given major and experience level one can estimate the demand for every course in the university. With knowledge that about one tenth of sophomore social science majors take Anthropology 1, a prediction can be made that there will be

about 250 sophomore social science majors demanding Anthropology 1 in 1976. One can make similar estimates for all other major and experience level categories to arrive at an estimate for the total demand for Anthropology 1. The same process can be repeated for all other courses. These enrollment forecasts are inputs to phase 3.

3. Estimation of faculty and space needs. With each course assigned an enrollment estimate, the individual department can then estimate the required classroom and/or laboratory space and the required faculty time invested in the course. Typically, faculty time estimates take rank into consideration. By aggregating all of these computations one arrives at an estimate of total space requirements and faculty needs (F.T.E. by rank). The output of phases 1-3 is then fed into phase 4.
4. Estimation of support needs. With knowledge of student body size, faculty composition and classroom requirements, estimates can be made concerning administrative staff, library, food service, student health service, etc.

Besides the fact that the output of one phase becomes the input of the next, there are other interactions between phases. For example, some graduate students are teaching resources and "consumers of teaching resources." Their presence tends to increase both demand and supply for "educational production."

The most ambitious models have been built by Koenig,[8] Judy,[9] and Weathersby.[10] Here we shall look primarily at Koenig's model but most of our comments will be applicable to the models of Judy and Weathersby as well as other large-scale simulations. Koenig prefers to consider a set of sectors of a university economy rather than a sequence of computational phases, but we will use the four-phase description given above.

In Koenig's model students are divided by level and subject field into disjoint categories. Since data requirements increase at a rate approximating the square of the number of these categories, it is advantageous to aggregate certain subject fields and/or experience level groups whenever possible. Markovian assumptions are made on the flow of students from class to class over time (i.e., the students have no memory). The number of entering students in each category in each time period must be estimated. Of course the possibility of students leaving the system must be incorporated in the model.

In allocating financial aid resources to departments, university administrators have partial control over student progress and the demand for course work in certain fields. These policy parameters are explicitly taken into account by Koenig's model. He attempts to isolate students affected by financial aids from those not. A simple Markov Chain model explains the flow of those not affected by financial aids. To explicitly express the effects of financial support he requires a matrix whose i-jth entry is the number of continuing students whose enrollment in category i can be attributed to the influence of a single assistantship in category j. Post-multiplying this matrix by a vector of assistantship availabilities yields a vector of enrollment adjustments for continuing students due to financial aid. The effect of fellowships is handled in an analogous fashion. For new students, similar matrices describe the enticement of fellowships and assistantships.

It might be instructive at this point to look at the first phase of Koenig's model before describing the remaining phases. Recognizing that different subject fields require different resources, one wishes to obtain an estimate of future student body size by subject field. The estimates are computed using Markov Chains and linear transformations. Inherent in these techniques are several weaknesses.

First, estimates of transition probabilities would normally come from past data. This means that some specific past policy decisions which are no longer relevant will be reflected in entries of the one-step transition probability matrix. Not only will previous administrative decisions come into play, but so will environmental issues which have influenced student behavior. The military draft and the war in Southeast Asia are two such issues which are to a great extent beyond the control of the educational administrator. In directly extracting transition probability estimates from historical evidence one implicitly assumes that these environmental issues will continue to have the same effect on student flows as in the recent past.

Changes in national policy thus contribute increased uncertainty and possibly bias to calculations based on the student flow transition probability matrix. **Although there is nothing in Koenig's model which prevents** one from substituting his own entries in the transition probability matrix for those derived from data, problems arise caused by personal fallibility and the workload involved in filling a matrix with a very large number of rows and columns (student categories).

A Markovian model is probably the most reasonable type to use here. We cannot imagine many benefits to be derived from using a more intricate student flow mechanism which depends intimately on individual student past history. But one must admit that the output of Phase I will be a set of fairly crude estimates. The main lesson to be learned here is that the number of student categories should be kept small. Advantages in having a large number of categories lie in more precise calculations in future phases. But if the output of Phase I is imprecise, there is no point in carrying forward large matrices full of numbers for accurate calculations to come.

Second, the use of linear transformations implies that increased enrollment due to financial aids is proportional to the number of positions available, that the number of new admissions into each student category is proportional to the total number of new students, etc. In a nutshell, there are no possibilities for economies of scale. One could easily argue that in reality there are decreasing returns to scale with fellowships and assistantships since preferred students who get the first fellowships are more likely to have competing offers than those who get the last.

Third, although Koenig has surveyed the effect of financial aid offers on graduate school attendance, it would be difficult to estimate entries in the four matrices which take explicit account of financial aid policy decisions (matrices for new or continuing students affected by fellowships or assistantships). It is commendable to take explicit account of policy variables in the model, yet to get data to fill these matrices seems an impossible task. Other variables not subject to administrative policy probably have as much effect as where the fellowship money is. Certainly one such variable is the availability of jobs after schooling. For example, the layoffs of aerospace workers have adversely affected undergraduate engineering enrollments. These factors can substantially outweigh factors included in the model. Koenig's model can take account of them only by having the user make judgemental modification of a number of parameters.

With all of their shortcomings the data on future student enrollment march on to Phase II. Koenig assumes that there are M course offerings in the university. With N student categories an N by M matrix is constructed whose i-jth entry is the demand for course j per student in category i. Demand is measured in student credit hours and research supervision units. Again linear transformations are used so that demand for a given course by students in a given category is assumed proportional to student enrollment in that category. Use of the word "course" does not imply that each individual offering need be distinguished. Broader categories such as lower division English, or mathematics for majors could be used.

Again, the price to be paid for increased disaggregation is an increase in data requirements. In using Koenig's model it would be advisable to aggregate course offerings whenever possible without serious loss of desired eventual output information. For example, if the primary concern was in estimating social science resource needs, courses in all other departments might be lumped into one category.

Data to fill Koenig's N by M matrix can be obtained from student history records. The data suffer from the same drawbacks as enrollment projection data, namely that they are affected by presently irrelevant past policies and by external effects. The user is free to change entries in the matrix and thus experimentally test the effects of such policy changes as relaxation of undergraduate breadth requirements, restructuring of particular major programs, introduction of new interdisciplinary curricula, etc. This phase of the model seems better suited to user experimentation than Phase I since many policy changes (e.g., modified breadth requirements) lead to either controllable or easily predictable changes in student demand for courses. However, with tendencies toward added flexibility in student programs, predictions of student demand for courses will become more difficult.

The third stage of Koenig's model calculates faculty, graduate assistant and environmental support resource requirements needed to meet student educational demands computed in Phase II. Again a linear transformation is used; the matrix is composed of input-output coefficients and a typical entry gives "the number of assistant professor FTE needed to produce one student credit hour in one of the M courses."[11] The transformation yields the total amount of faculty effort, graduate assistant effort and the environmental support needed to satisfy the previously computed student demand for course credits and research supervision as well as the demand for outside services (consulting, research under grants, etc.).

Perhaps the weakest computational link in Koenig's model is the input-output matrix at the third stage. Data on the allocation of faculty time, for example, are not regularly kept by universities. Koenig mentions two alternative procedures: a polling of faculty for self-evaluation and an effort breakdown based on salary source. In the latter case, a faculty member working 50% time on a research grant might be said to do half research and half teaching. The latter method is crude; the former is a good example of a procedure far too costly for the results produced. The increased precision obtainable through polling faculty is not merited considering the fact that entries in the input-output matrix must be multiplied by imprecise entries in the course demand vector.

Breneman studied the stability over a five-year period of entries in the third stage input-output matrix using data for the University of California at Berkeley. His primary conclusion was "that certain coefficients were reasonably stable during the five year period with maximum fluctuations between 13 and 20 percent, that other coefficients displayed definite trends..., but that the majority fluctuated in positive and negative directions with annual changes as high as 200 percent."[12]

The entries in the Phase III input-output matrix can be regarded as policy coefficients subject to change by the user. As in Phase I, the model has been built to make the role of policy variables explicit. This is an advantage to the decision-maker.

The final phase in Koenig's simulation computes non-academic production resource requirements. Non-academic production includes registration, residence hall, food and medical services. The number of units of each type of service required is assumed proportional to the student enrollment. Once the service requirements are computed, an input-output matrix is used to calculate the necessary personnel effort and environmental facilities required to provide this service.

In discussing Koenig's model we have pointed out problems inherent in the availability of data and the expense of preparing it as well as computational features of the model which lead to imprecise results. In painting a somewhat negative picture we should mention that the model, generally speaking, is as reasonable as could possibly be built with limited data and computational technology. It would be unfair to conclude that simulation models could never be worth their salt. With improvements in data availability much of the preparation costs could be saved.

There are dangers of oversell, however. To an extent, simulation of educational institutions is a fad. Like other operations research techniques in the past, there is a distinct possibility of many expensive applications followed by discovery that the panacea just isn't there. What must be stressed repeatedly is that simulation is a tool to aid decision-makers; it provides one more input to a university president or planner. What must be avoided is a blind faith in the accuracy of output numbers with seven significant digits just because they appear on that funny paper with holes down the sides.

Perhaps the most obvious shortcoming of university simulation models is the failure to include some procedure for estimating the possible error in output. It would be time-consuming to estimate confidence intervals for every entry in every input-output matrix but some crude measure should be tried. At this point in time, it is important to come to grips with questions of accuracy before building more simulations for more institutions.

Judy's CAMPUS model was designed at the University of Toronto for use there and more generally. Differences between Canadian and American universities make it less suitable for direct use in the United States. However, the notion of a single simulation model readily adaptable to any university is an attractive one. Many administrators might conclude that a simulation model is worth buying but not worth constructing from scratch. Judy's purposes in constructing CAMPUS were to assess the flexibility of the system simulation approach to university problems, determine the availability of required data, investigate the applicability of statistical methods to these data and determine the various facets of the university system and inherent modeling difficulties. He envisioned four types of questions which the CAMPUS model could help answer: (1) What are the resource implications (faculty, physical plant and total budget) of particular enrollment projections? This is a direct output of the four simulation phases which we have mentioned. (2) What are the resource implications of meeting established goals on educated manpower? In this case, the university can control the enrollment in each field. (3) What are the resource implications of particular changes in curriculum? (4) What are the resource implications of general policy changes?

Missing from all of these simulation models is a fifth vital question: What are the resource implications of external governmental actions, environmental changes, and changes in public tastes? A mechanism for answering such questions is impossible to build into a university system simulation. The resource implications are likely to be much harder to predict for a university--a non-profit producer of educated manpower--than for a profit-making firm which makes consumer goods. Weathersby[13] has used multiple linear regression techniques to estimate some of the effects of these variables which are beyond direct control of university administrators.

Weathersby's university cost simulation model[14] is currently being modified by WICHE. Called the Resource Requirement Prediction Model (RRPM), it will be designed to be readily applicable to universities in the United States. Although his model is quite similar to the others (in that it generally follows the four phases mentioned), Weathersby[15] points out some of the difficulties encountered in the modeling process.

Classroom space, for example, is generally assigned as a known function of student body size, student credit hours or student classroom contact hours. Classroom needs are then easily computed from the model. However, on many campuses, instructional space (classroom, labs, faculty offices) make up less than 20% of the total space in campus buildings. A crude method must be used to compute the total physical plant budget.

Non-teaching academics are another problem since their numbers do not hinge so intimately on student enrollment. Weathersby's model uses linear regression techniques to estimate future requirements of non-teaching academic personnel.

In dividing the university's activities into several disciplines for a cost simulation there are often organized research activities which cannot be conveniently categorized. Examples within the University of California system are a liquid air facility and a pilot secondary school. For the purposes of the model some categorization must be made.

Levels of campus-wide activities such as libraries, residence halls and administrative overhead are estimated by regression techniques in Weathersby's model. All of these difficulties illustrate the fact that the student enrollment to class credit hours to faculty FTE to office and classroom space transformations prevalent in university simulation models leave a large budgetary slice of university activities undetermined. Levels of these activities must be estimated by other techniques such as multiple linear regression or by simplifying assumptions which relate them to levels of activities determined through the input-output phases of the model.

Weathersby has tested his model on past Berkeley data and has found it to be generally successful with errors typically under 5%. He feels that it is more important to change simulation models to attempt some type of value-structured optimization than to refine cost estimates to reduce errors.

In the past, simulation builders have avoided optimization and have been content to compare alternative policies along several measures. This reluctance is due in part to the extreme difficulty of assigning a dollar value to student experience at a university. There are many problems inherent in applying popular tools for the profit-making firm to an institution whose products are difficult to evaluate in a market sense.

Past attempts at evaluating education have typically compared discounted income streams for people with and without schooling at a particular level. Besides increased earning power, there are immeasureable educational outputs (e.g., self-actualization). Although optimization is a difficult process when dealing with human products, efforts in this direction might give planners more insight than present simulations can provide. Modern operations research techniques are blessed with sensitivity testing options so that alternative policies can be evaluated under a wide range of assumptions on, say, the dollar value of a four-year undergraduate liberal arts education.

In mentioning Koenig, Judy and Weathersby we did little justice to the numerous existing simulation models here and abroad. Many others are reviewed by Wurtele.[16] Simulation has been used by UNESCO in modeling the educational development in Asian countries. Other American models have been built by Nordell,[17] the firm of Peat-Marwick-Mitchell,[18] and groups at Tulane[19] and the University of Indiana.[20] Peat, Marwick and Mitchell, as consultants to eight small private colleges, developed a smaller scale simulation model designed to aid a private institution in financial planning. The work of Paschke and Perkins at the University of Indiana uses multiple linear regression techniques to predict future enrollments for various different sets of values or exogenous variables. One of the limitations of curve-fitting techniques is that the effect of policy variables becomes clouded. There are advantages to approaches where policy variables are explicit (e.g., as coefficients in an input-output matrix).

We have pointed out that optimization is extremely difficult in university simulations. Also various factors contribute to imprecise output. Even with these drawbacks there is an important role for simulations to play in testing new policies. The computer model handles thousands of relationships (albeit linear ones) at once--far more than the human brain can manipulate. Simulation models can be helpful in singling out policies which would prove to be real administrative blunders for reasons that an administrator could not hope to analyze. Although resource estimates are far from precise, a costly blunder would still show through. It is a great success to catch such an error in the simulated future and avoid having to deal with it in the real future.

In conclusion, large scale simulation models of universities are mostly based on input-output analysis. They are costly and inaccurate, yet they may still serve a useful purpose. There are dangers in using them without a good grasp of their shortcomings. Perhaps the most helpful step would be to build in some measure of their precision; thus it would be helpful to know whether a budget estimate of $100 million was 100 ± 2 million or 100 ± 20 million.

SECTION II
ADDITIONAL MODELING EFFORTS

In this section we review some further applications of operations research technology to problems in educational administration. These models are less ambitious in terms of data requirements--a frequent advantage to the educational administrator.

Oliver, Hopkins and Armacost[21] have constructed a model designed to aid administrators in resource planning. It requires far less data than the above simulations and provides a much smaller volume of output. These authors have chosen to work with a highly aggregated model and a small number of variables which capture the essence of the inter-relationships between resources within a university.

To simplify computations, time dependencies are not included in the model. Instead, the authors examine properties of the equilibrium which would result from continued use of given policies. Thus, rather than answering questions such as "What will the enrollment mix be in 1980?" the model provides responses to "In what direction will a given set of policies lead us with respect to enrollment mix?"

Conservation of flow equations in a network are used to relate inputs to outputs. Knowledge of the average time spent in the system by students permits computation of the average student inventory level (by equations analogous to "$L=\lambda W$" of queuing theory). At the beginning of any time period, external society, the network's source, provides flows of students separated into eight categories by highest degree aspiration (2-year undergraduate, 4-year undergraduate, Master's, Doctoral) and eventual achievement (dropout, attain degree); society also provides a source for non-tenured and tenured faculty. Some students fill teaching assistant roles before leaving the university, others become non-tenured faculty within the university. Outputs to society, the network's sink, are educated students in each of the eight categories specified above and non-tenured and tenured faculty. Resources flowing into the sink are available as inputs in the succeeding time period. Thus, conservations of flow equations insure that an equilibrium is established.

Not only must conservation of flow hold at every node of the network (e.g., rate at which students enter each of the eight cohorts must equal rate at which they leave) but technological constraints relating the magnitude of flows through different nodes must hold as well (e.g., the inventory of teachers must be sufficient to instruct the inventory of studemts). A technological matrix whose entries give the number of teachers of a given type required to instruct a student in a given cohort is used to provide this link.

The various conservation of flow and technology requirements are all expressed by linear equations. Specifying values of some of the variables allows one to solve for the others. It is possible, as a by-product of this model, to compute various productivity indices relating outputs to inputs (e.g., the proportion of undergraduates who graduate) or relating outputs to faculty inventory levels (e.g., the number Ph.D.'s per year per faculty member).

This size of model appears to have several advantages over the expensive large-scale simulations. It is far less expensive to implement. It represents a better match between input precision and detail and the predictive power of the output. It is less subject to administrative misuse since its output is far less voluminous and overwhelming and its structure is more easily understood by the layman.

Whereas the Oliver, Hopkins and Armacost model might be viewed as a direct competitor to the cost simulations, the models to be discussed below refer to specific administrative problems or specific sectors of the academic community.

Geoffrion[22] has used decomposition programming and revealed preferences to assist the UCLA Chancellor in allocating scarce faculty FTE and student enrollment ceilings to departments on campus. The computational scheme depends on man-machine interaction to iterate through a sequence of locally optimal allocations until a globally optimal allocation is found. Through interviews, local properties of deans' preference functions can be induced at each iteration. The success of these techniques is as yet untested in practice.

Bruno[23, 24] has made two applications of linear programming techniques to problems in educational administration. In one application[25] he introduces nine variables which a school administrator might wish to affect faculty salary differentials (e.g., longevity of service, educational background, difficulty of teaching assignment, existence of extra administrative duties, etc.). Each of these variables are scaled; the purpose is to find a set of weighing factors for each variable which leads to an optimal salary schedule within constraints on total budget and the inter-relationships of certain salaries (e.g., superintendent of schools should get higher pay than each teacher). The administrator specifies a linear objective function which places heaviest weight on the variables which he feels to be most important.

Bruno's second effort[26] uses linear programming to recommend procedures whereby a state can allocate money to school districts. His model has been applied to the junior college districts of California. He discusses several possible objective functions designed to make the distribution of foundation type funding more equitable.

The simulations discussed in Section I used Markov Chain models of student flow between field and level categories. Gani[27] has used Markov Chain models with success and has found that transition probabilities can reasonably be assumed to be fixed for periods of time approximating five years. Oliver[28] compared Gani's approach to a "grade progression ratio (GPR)" technique employed by the State of California. He found that a highly aggregated Markov model possessed advantageous features missing in GPR, namely that contributions to the enrollment in a given grade are identified by their previous year's status and that variance estimates of future predictions have a desirable structure. A close fit to real data was found in applying the Markov model to the Berkeley campus of the University of California.

Marshall and Oliver[29] made a sensible modification of the above model which reflects the traditional requirement that an entering freshman must complete roughly eight semesters of successful work before graduating. They simply assume that at the beginning of each semester a student chooses to attend school with probability p, vacation or take a leave of absence with probability q or drop out of the university (never to return) with a probability r=1-p-q. An attending student then succeeds in completing a semester's work with probability s. This process continues until the student has either graduated or dropped out. The model is particularly simple since p, q, t and s are assumed independent of a student's past progress, yet it gives a very good fit to data on two large cohorts of Berkeley students. The success of this model hinges on capturing the effect of graduation on the remaining cohort size in a simple way.

Markov Chain models have been applied to the progression of faculty through different ranks. (Faculty, too have no memory). The principle works in this area are by Oliver[30] and Bartholomew.[31]

The facts that retirement rates from tenured ranks are lower than those from non-tenured ranks and that promotions go from non-tenured to tenured but not vice-versa would lead one to believe that a university might in the long run become saturated with tenured faculty. The purpose of Oliver's investigation was to find conditions on hiring, promotion and retirement rates which cause a university of constant total faculty size to reach an equilibrium mix of tenured and non-tenured faculty. His model uses three states (tenured, non-tenured, retired) and assumes that the administrator can regulate new appointment, promotion and retirement rates while known resignation and death rates apply to each individual in each state. Appointments must balance with resignations, deaths and retirements. Conservation of flow equations must hold for the non-tenured and tenured states. Oliver concluded that existing Berkeley promotion and hiring policies prevented an equilibrium from being reached; to get to equilibrium, retirement rates would have to double and fractional promotion rates from non-tenured positions would have to drop to one sixth of their value. A strange result is that increased rates of new appointments to tenure will reduce the equilibrium number of tenured faculty.

Whereas Oliver is concerned with describing the existence and character of an equilibrium arising from a given policy, Bartholomew is interested in the existence of policies which will lead a system to a given desirable equilibrium. He assumes that only the numbers of new appointments in each grade can be changed. He shows that some equilibria can be reached from any starting conditions, others from a proper subset of starting conditions and still others not at all. Furthermore, although certain mixes of tenured and non-tenured faculty might be attainable, they might not be maintainable (i.e., they are out of equilibrium). Bartholomew's work is a preliminary step toward a theory of control of Markov chain models of graded manpower systems. A related paper by Branchflower[32] provides numerical examples of Bartholomew's findings.

SECTION III
CONCLUSIONS

The primary purpose of all of the above mathematical models is to provide advice to university decision-makers which will improve their predictive powers and lead to improved policy decisions. Large scale cost simulations have been built which allow administrators the opportunity of testing the effects of various policies before implementing them. There are shortcomings in the structure of the models: computational technology is not sufficiently refined to include economies of scale, curve fitting estimates must be made for resource requirements which do not follow logically from student demand, research activity must be arbitrarily categorized, error estimates are not included, etc. More serious than shortcomings in the way that a simulation model transforms its inputs into outputs are problems in the implementation and interpretation of the models. Data requirements make the use of such models infeasible at some institutions and very costly at others. Costs will only be reduced when computer addressable data files are commonplace. Even then there will remain the ticklish tradeoff between the use of readily available past data (incorporating inefficiencies and irrelevant policies) and the costly and speculative filling of input-output matrices with administrators' best estimates. At the output stage there are dangers of blind acceptance of a ream of output data.

None of the models which we have discussed are capable of predicting and accounting for environmental effects outside the academy. The possible abolishment of military conscription, the changing job market, increasing affluence and the changing tastes of youth will contribute to future student flows in ways which are difficult to predict. To put it simply, the variables which might have the greatest effect are outside of the model and there is no way to bring them in. With this in mind it is important to design a model of realistic scale which does not exert too much costly energy in making computations at an unreasonable level of accuracy. We feel that, for most institutions, the level of ambition of the Oliver, Hopkins, Armacost model is more appropriate than that of the large-scale simulations.

Some of the other models discussed show an increase in the application of operations research tools to problems in educational administration. Although such tools are often difficult to apply to a producer of educated human resources there are still many uses for management science technology. Provided that one carefully considers the limitations of the models applied, management science can assist in improving the efficiency of educational operations.

NOTES

[1] See Chapter 21.

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CHAPTER 23

ALLOCATION OF A UNIVERSITY'S RESOURCES TO INSTRUCTION

In order to get a rough idea of how money for higher education is actually spent we examined the budget of the University of California briefly and then decided that the budget of UCLA or Berkeley might be more informative because the whole University system includes several developing campuses which tend to introduce distortions of one kind or another in what might be considered a normal university budget. UCLA and Berkeley are in a relatively stable state, having reached their enrollment ceilings according to the California Master Plan for Higher Education, and hence might be reasonably representative of a large public university. We chose to look at UCLA simply because it is handier to the Irvine campus where we are located.

The main object of the analysis was to allocate resources for instruction to lower division, upper division and graduate students, but while we were about it we looked also at the allocations to other activities. There is a discontinuity in the analysis because it moves back and forth between fall 1969-70 enrollment data and a 1968-69 survey of faculty output and effort. We presume the discontinuity is not important because the compositions of the UCLA faculty and student body were much the same in the two years.

Enrollment data for the fall of 1969-70 were taken from the UCLA Report RE311, dated November 4, 1969. This report gives, by department, the number, level and name of each course, its instructor and the numbers of lower, upper and graduate division students enrolled in the course.

It was assumed that each course took the form of one or more of six types of activity: lecture, seminar, discussion, laboratory, studio and research. The activity or activities relevant to each course and the number of hours per week allotted to each were given in the "UCLA General Catalog, 1968-1969" and in the pamphlet "UCLA Schedule of Classes, Fall Quarter 1969."

Course instructors were assigned to one of six ranks: professor, associate professor, assistant professor, lecturer, instructor or research associate, or graduate student. The rank of each individual instructor was obtained from the "UCLA Catalog, 1969-1970" and from the "UCLA Directory, October 1969." Additional information, not available from the sources listed above, was obtained from the UCLA Report RE310. Adequate information concerning certain health science departments were not available and they were, therefore, eliminated from the study. These are the departments of Anatomy, Biomathematics, Biophysics, Medical History, Medical Microbiology, Medicine, Physiology, Psychiatry, Nursing, Pathology, Pharmacology, Public Health and Radiology. The departments had a total of 3,129 students (868 lower division, 785 upper division and 1,456 graduate division) enrolled in their courses. The ROTC departments - Aerospace Studies, Military Science and Naval Science - and the English Subject A Department were also eliminated from the study.

In extracting information from our data sources it was occasionally necessary to make additional assumptions when the desired information was either unavailable or unreliable. In some cases, information given by the Reports RE311, RE310 and the pamphlet "UCLA Schedule of Classes, Fall

Quarter 1969" concerning identical subject matter did not agree. In these instances the data were taken from RE310. This report was the most detailed source of information and was compiled by UCLA during the fall quarter 1969 specifically for statistical purposes.

Information concerning the number of discussion or laboratory sections in a course was taken from the pamphlet "UCLA Schedule of Classes, Fall Quarter 1969" and from Report RE310. The former source, however, was published before the Fall Quarter 1969 and therefore only took into account the expected number of students in a course, not the actual number enrolled. As a result, in some courses the number of sections appears insufficient for the number of students enrolled. In other courses the number of sections appears excessive for the number of students enrolled. For example, Chemistry 1A had 8 laboratory sections listed for the 775 students enrolled in the course. Economics 2 had 21 discussion sections listed for the 74 students enrolled in the course. In all cases such as these, the number of sections appropriate to the course was calculated and inserted in the data. These calculations were made on the basis of the average number of students in discussion or laboratory sections in courses of the same level (lower, upper or graduate division) in the department.

Reliable estimates of student-faculty contact for upper and graduate division research courses were not available. Faculty-student contact at the graduate level was assumed to be one hour a week per student, up to a maximum of six hours a week for the faculty member. Faculty-student contact at the upper division level was assumed to be .75 hours a week per student, up to a maximum of 5 hours a week for the faculty member.

Assumptions were made concerning hours of practice courses in the Art, Social Welfare and Theatre Arts Departments. Hours given in the official reports for these courses were based on the amount of student time devoted to the courses and do not reflect the faculty-student contact hours.

In the Art Department, the instructor was assumed to spend 50% of the given course hours with the students at the lower division level, and 25% of the given course hours with the students at the upper divison and graduate division levels. In the Social Welfare Department, the instructor was assumed to spend 25% of the given course hours with the students. All courses in this Department are at the graduate level. The hours given for each of the practice courses in the Theatre Arts Department varied considerably. For this reason, the number of hours an instructor was assumed to spend with his students in these courses varied in relation to the type of practical course, the given number of course hours and the number of hours spent by the instructor in other courses in the Department.

It was assumed that all discussion and laboratory sections were taught by teaching assistants unless Report RE310 specifically showed the case to be otherwise.

In a number of cases, a rank could not be found for an instructor. If more than half of the instructors teaching lower division courses in a department were of unknown rank, and if these instructors taught only lower division courses, they were assumed to be teaching assistants. In all other instances, instructors for whom no rank could be found were placed in an "unknown" category.

In certain departments, the department head or another faculty member was listed as teaching all or a large part of the graduate research courses. For instance, an associate professor was listed as supervising all 54 students enrolled in the Economics research course 597. In cases such as this, the instructor for the course was designated "unknown."

In certain of the language departments an instructor was listed in charge of all sections of a lower division course, even though as many as fifteen sections of the course were listed. It was assumed here that the instructor taught only one section of the course, the remaining sections being taught by teaching assistants. In addition, it was assumed that an instructor in the French Department taught no more than one lower division class, in view of their upper division teaching load.

The assumptions listed above were made on the basis of information gained from discussions with University of California undergraduate and graduate students, staff and faculty representing various subject areas. These assumptions were made only when data were unreliable or unavailable. The vast majority of data in the study were obtained directly from the official sources noted previously.

The summary data derived from these class enrollment figures are given in Tables 1, 2, 3, and 4. Because of the various adjustments that have been made, entries in the tables have generally been rounded to two or three digits to reflect their real accuracy; for this reason tabular items may not add to totals.

Table 1

Student Enrollment by Level

Lower Division		8,940	
Upper Division		10,780	
Graduate		8,850	
	Total	28,560	(general campus excluding health sciences)

Table 2

Faculty Teaching at Least One Course

Rank		Number
Full Professor		466
Associate Professor		253
Assistant Professor		505
Lecturer		167
Instructor		49
	Total	1,440

Table 3

Faculty Teaching Hours

	Lower Division Courses	Upper Division Courses	Graduate Courses	Totals
Professor	170	580	2,160	2,900
Associate Professor	150	420	1,080	1,650
Assistant Professor	420	1,140	1,670	3,230
Lecturer	280	480	360	1,120
Instructor	110	100	140	350
Totals	1,130	2,700	5,390	9,250

In the fourth table we point out that the entries refer to the actual level of the student--not to the level of the course in which he was enrolled; the entry in the upper left corner of the table, for example, was obtained by multiplying the number of lower division students in each course taught by a full professor by the number of credits carried by the course and summing the resulting products.

Table 4

Student Credit Hours

Rank of Instructor	Lower Division Students	Upper Division Students	Graduate Students	Totals
Professor	15,600	27,700	24,100	67,400
Associate Professor	13,800	18,300	11,600	43,600
Assistant Professor	26,400	42,800	19,600	88,800
Lecturer	15,000	16,200	4,700	35,900
Instructor	2,600	2,300	2,300	7,200
Totals	73,400	107,300	62,300	243,000

Now we turn to another source of information.

Faculty allocate much of their time to research and to other activitie which neither directly involve student contact nor preparation for student contact. Responding to surveys is a good example of such other activity. In the 1968-69 school year, the University of California conducted a survey on all campuses of faculty time allocation. A 15% sample of faculty membe at all campuses were asked to report on the allocation of their time to eac of the nine activities listed in the first nine lines of Table 5 which reports the responses from the UCLA campus partially broken down by faculty rank. The survey did not include lecturers and it lumped assistant professors and instructors together. It also omitted academic positions which carry no teaching responsibility. These amount to about 7% of the total number of academic positions; they are mostly for librarians but included also are some for counselors and some full time administrative positions that carry academic rank.

Table 5

Percentage of Time Devoted to Various Activities

Activity	Professor	Associate Professor	Assistant Professor or Instructor
1. Student Instruction	33.6	28.2	31.9
2. Research	15.1	14.1	16.1
3. Public Service	4.7	4.9	2.5
4. Instruction & Research	11.6	18.6	20.5
5. Instruction & Public Service	2.1	1.6	2.4
6. Research & Public Service	2.4	3.7	2.2
7. Instruction, Research & Public Service	6.6	10.1	8.0
8. Administration	9.8	6.3	5.0
9. Other	14.1	12.5	11.5
10. Total Instruction	42.7	41.7	46.7

The first item, instruction, includes time spent in lecturing, preparing for lectures, meeting with students during office hours, grading papers, preparing examinations and so on. The fourth, fifth and seventh items are activities that have some instructional component; thus a research seminar would be included in item 4, assistance by graduate students in a professor's evaluation of the impact of a proposed city ordinance might put the evaluation in item 5, if the evaluation also involved some research it would go in item 7. An estimate of total instructional effort is given in the bottom line of Table 5; it was obtained by simply adding to item 1 half of item 4, half of item 5 and a third of item 7. The number 46.7% for assistant professors and instructors will also be used for lecturers inasmuch as Tables 2 and 3 indicate that all three ranks have about the same average teaching load.

We cannot apply the percentages at the bottom of Table 5 directly to the time of the 1,440 faculty shown in Table 2 who were teaching at least one course because there are other faculty members who, though not teaching in the fall quarter, will be teaching in the other quarters; they happen to be spending the fall quarter in a research or public service or administrative activity. Those that are teaching must be devoting more than forty-odd percent of their time to instruction because some of them will not be teaching in other quarters. We must, therefore, augment the 1,440 by the non-teaching faculty who will be teaching in another quarter. We can do it only roughly because records of persons on sabbatical leaves, on leave of various other kinds, and of unfilled positions are not centralized.

There were 2,840 academic positions in the 1969-70 budget. We have accounted for 1,440 actually teaching in the fall quarter and attempt to account for the remaining 1,400 in Table 6 which displays first those 1,440 teaching in the fall quarter; then it displays 150 in the health science departments for which detailed class enrollment data were not available; thirdly it displays 240 positions for teaching assistants and fourthly it displays 190 positions which carry no teaching responsibilities at all (these are mostly librarians). All these figures are fairly solid--

that is, should be accurate to within 5%. The next figure is obtained simply from a University-wide planning factor and may have a larger error--perhaps 10%. Finally we get down to 460 positions which are made up of two categories: unfilled positions and faculty who happened not to be teaching in the fall quarter. There are no data which give any clue to splitting the 460 between these two, but on the basis of conversations with institutional researchers at UCLA and Berkeley we take the number of unfilled positions to be 200 and guess that it may be off by as much as 50%. That leaves 260 as our estimate of non-teaching faculty on campus in the fall of 1969; the estimate of total teaching faculty is that number plus the first two items of Table 6, that is, 1,850. We shall distribute those 1,850 among ranks in the same proportion as the 1,440 are distributed in Table 2. The results of the distribution are given in the first column of Table 7.

Table 6

Rough Accounting of Academic Positions

1,440	Teaching at least one course in fall 1969
150	In departments omitted from course tabulation
240	Teaching assistants
190	Never had any teaching responsibility
360	On sabbatical leave
460	Unaccounted for
2,840	Total

In order to add together the instructional resources supplied by the different faculty ranks we have converted time to dollars using average salaries for the ranks which are shown (in $1,000's) in the second column o

Table 7. This table calculates the total salaries (using a nine month basis throughout) paid to the instructional staff for instruction itself; all dollar amounts are in thousands of dollars. The mean academic-year salaries in the second column are multiplied by the number of faculty at each level to obtain the total salary for instructional staff in the third column; then the percentages taken from the bottom line of Table 5 are applied to obtain the proportions of total salary assignable to instruction. We have included teaching assistants in this table and have assumed that 100% of their time is devoted to instructional purposes.

Table 7
Calculation of Instructional Salary (in thousands of dollars)

Rank of Instruction	Number	Average Salary	Total Salary	Instructional Percentage	Instructional Salary
Professor	600	20.9	12,540	42.7	5,350
Associate Professor	325	14.5	4,700	41.7	1,980
Assistant Professor	650	11.1	7,200	46.7	3,360
Lecturer	215	11.9	2,500	46.7	1,190
Instructor	60	7.8	470	46.7	220
Teaching Assistant	240	6.0	1,440	100.0	1,440
Total					13,540

Finally in Table 8 we have calculated the proportions of total instructional salary ($13,540,000) allocable to the three levels of students. The allocation is given in the bottom line of the table which contains the column sums. The allocation of instructional salary at each faculty rank was done in accordance with the teaching hours shown in Table 3; that is, the number 320 in the upper left corner of the table is (except for rounding) obtained by multiplying 5,350 by the fraction 170/2900. For teaching assistants the allocation was done in proportion as lower division, upper division and graduate students enroll in lower division courses; these proportions are 0.696, 0.291, and 0.013. Excepting teaching assistants, the implicit assumption of Table 8 is that faculty devote instructional time to the three levels of students in the same ratio as they teach the three levels of courses. The allocation indicates that the higher ranks devote relatively little effort to lower division students, but another way to look at it is that the instructional process is considerably more efficient in lower division courses where professors lecture to large groups; in fact, we observe on looking at the upper left entries of Tables 3 and 4 that the average number of lower division students in a professor's class was 92 (15,600 divided by 170) whereas for graduate students the average was 11. (These are not average class sizes; the average size of a professor's lower division lecture class is 232.)

Table 8
Allocation of Instructional Salary (in thousands of dollars)
to Level of Students

Rank	Lower Division Students	Upper Division Students	Graduate Students	Total
Professor	320	1,060	3,970	5,350
Associate Professor	180	500	1,300	1,980
Assistant Professor	440	1,180	1,740	3,360
Lecturer	300	510	380	1,190
Instructor	70	60	90	220
Teaching Assistant	1,000	420	20	1,440
Total	2,310	3,730	7,500	13,540

We now turn to a brief analysis of the total UCLA budget. In the 1968-69 academic year the budget totaled $113 million. We shall estimate the proportions of this budget devoted to each of five categories: 1) student instruction, 2) research, 3) public service, 4) educationally related activities (teaching hospitals, glee clubs, library, closed circuit television, etc.) and 5) overhead (including all expenses of campus-wide administrative officers, physical plant upkeep, etc.).

Our first task was to assign each line of the budget to one of the six major categories shown in Table 10. We then allocated academic salaries to instruction and the three other subcategories of Table 10. In labelling each line of the budget we had to make many arbitrary decisions. Most of these involved relatively small sums of money and had negligible effect on the final allocation, but others had a very significant impact. Table 9 shows selected items in the two categories which offered most difficulty: public service and educationally related activities. The allocation of items to research and administration were less subject to doubt. The hospital is a huge item and one can completely change the relative sizes of public service and educationally related activities by shifting it from one to the other. We have put practically all hospital items in educationally related activities.

Table 9

Sample Items in Two Budget Categories

Educationally Related Activities:	Botanical Gardens	105,000
	Surgery Supplies	26,000
	ROTC	31,000
	Educational TV	332,000
	Instruction on use of computers	150,000
	Regents professorships	27,000
	Dentistry clinic	104,000
	U.C. hospital administration	2,512,000
	U.C. hospital nursing	3,610,000
	University elementary school	377,000
	UCLA band	51,000
	Psychology clinic-school	95,000
	Vivarium (life sciences)	77,000
	Medical vivarium	90,000
	Library	5,200,000
	Counseling and testing	110,000
	Fine arts productions	461,000
	Counseling center	361,000
	Student cultural program	73,000
	Student publications	115,000
	Intercollegiate athletics	520,000
	Student financial aid	1,350,000
	Summer quarter libraries	106,000
Public Service:	School of Education - Special programs	126,000
	U.C. hospital-UCLA medical group	59,000
	Engineering - special programs	84,000
	Art galleries	72,000
	Art exhibitions	53,000
	Ethnic collections	89,000
	Ethnic exhibits	15,000
	Dance and music special programs	64,000
	Special theater programs	75,000
	Special motion picture programs	52,000
	University extension	1,367,000
	Public ceremonies	16,000
	Student & alumni placement center	239,000
	Educational placement service	91,000

The first line of Table 10 simply used the total shown in the budget for academic salaries ($37,350,000) and diminished it by the following items

Librarians	$1,590,000
Elementary school and vocational education	310,000
Counselors	100,000
Total	$2,000,000

intended to estimate positions with academic rank but no instructional or research activities. This leaves in the academic salaries all academic positions associated with organized research and organized public service; the assumption is that these positions are all filled by part of the time of faculty members and that the time they devote to these activities is taken account of in the percentages given in Table 5.

In breaking down the academic salary total into the four amounts shown in lines 2, 3, 4, 5 of Table 10, we first removed $200,000 for certain deans' positions and put that amount in line 5; then we removed $3,150,000 for sabbatical leaves and put it in line 4 under the assumption that doing or organizing or writing up one's research is by far the dominant sabbatical activity. Then there remained $32,000,000 to be allocated in accordance with the following proportions derived from the survey of faculty time and effort (by dividing equally the time devoted to joint activities):

Instruction	43.5%
Public Service	9.0%
Research	27.5%
Administration and other	20.0%

Table 10

Initial Breakdown of UCLA Budget (in thousands of dollars)

1.	Academic Salaries		35,350
2.	Instruction	13,920	
3.	Public Service	2,880	
4.	Research	11,950	
5.	Administration & Other	6,600	
6.	Academic Support		10,990
7.	Organized Research		2,030
8.	Public Service		7,510
9.	Educationally Related Activities		26,880
10.	Administrative		30,450
	Total		113,210

Line 6 of Table 10 simply includes non-academic salaries, general assistance, supplies and expenses, and equipment and facilities items in departmental budgets; line 7 includes the same items in organized research budgets. Line 8 includes not only the same items in organized public service budgets, but various other activities as illustrated in Table 9. Line 9 items are illustrated also in Table 9. Line 10 includes everything else and generally includes all activities of campus-wide elements of the University; it also includes operation of deans' offices.

The final step of the analysis is given in Table 11 which allocates the total budget to four categories. The numbers in parentheses in Table 11 refer to lines of Table 10. The allocation computation first allocated line 5 of Table 10 proportionally to lines 2,3, and 4 of Table 10. After adding in those increments, line 6 of Table 10 was allocated proportionately and those new increments added to the previous sums. Then lines 7,8, and 9 were brought down to Table 11 and added in appropriately. Lastly the resulting sums were used to allocate line 10 proportionately and those increments added in to give the numbers on the right hand side of Table 11. Many persons will be very doubtful about the validity of these proportional allocations and will believe the breakdown in Table 10 to be more informative than that in Table 11.

Table 11

Final Allocation of UCLA Budget (Millions of dollars)

Instruction		30.6
Academic Salaries (2)	13.9	
Proportion of Academic Administration (5)	3.2	
Proportion of Academic Support (6)	5.3	
Proportion of Administration (10)	8.2	
Research		29.1
Academic Salaries (4)	12.0	
Proportion of Academic Administration (5)	2.7	
Proportion of Acadmic Support (6)	4.6	
Organized Research (7)	2.0	
Proportion of Administration (10)	7.8	
Public Service		16.7
Academic Salaries (3)	2.9	
Proportion of Academic Administration (5)	.7	
Proportion of Academic Support (6)	1.1	
Public Service (8)	7.5	
Proportion of Administration (10)	4.5	
Educationally Related Activities		36.8
Educationally Related Activities (9)	26.9	
Proportion of Administration (10)	9.9	
Total		113.2

We are able to draw no particularly illuminating inferences from these data. It was already well known that graduate education and research were extremely expensive endeavors whereas undergraduate education is not terribly expensive. With respect to undergraduate education we find in Table 8 that about 44.5% of instructional salary is devoted to undergraduates; applying that percentage to the total amount ($30.6 million) in Table 11 for instruction we get $13.6 million, which is only 12% of the total budget. Since there were nearly 20,000 undergraduates, we find that expenditures for their instruction were less than $700 per student. These students must also be allocated some of the Educationally Related Activities budget but not a great deal because it is much dominated by the hospital and medical items; even the second largest area, the library, is mostly attributable to graduate education. It appears that even digging very deeply into these related activities and into public service, one could not come near the figure of $1500 per student which is widely quoted by private colleges as the minimum for maintenance of an acceptable undergraduate program. We may conclude that UCLA is very efficient, indeed, in providing undergraduate education.

When one finds efficiency in one area, he may reasonably expect it in others, and there is nothing in these data to indicate otherwise. In fact, on comparing these data with various statistics for land grant institutions in the aggregate, UCLA is quite in line with them in all respects. We simply have to conclude that these figures show what it costs to do graduate education and to do research. If society finds these costs unbearably high, then it may have to make some hard decisions about which arenas of research and which arenas of graduate education it would like to curtail.

CHAPTER 24

INNOVATION IN PRIVATE COLLEGES AND UNIVERSITIES IN CALIFORNIA

INTRODUCTION

Private colleges and universities in California were surveyed mainly to search for innovations that might not have appeared in the literature. We selected California partly because it was handy and partly because we were aware that at least a few of its private institutions were undertaking significant educational experiments. We selected private colleges because practically all of them have been under severe pressure to economize; most of them are supported almost entirely by tuition and they are effectively banned from escalating tuition by the relatively low tuition rates of California's public institutions. Thus, there were a priori grounds for supposing that necessity might have generated significant devices for achieving greater efficiency.

We do not claim that California's private institutions form a representative sample of all private institutions. We are not attempting to measure population characteristics. Our object was simply to seek innovation and we claim merely that California's institutions appeared to be as promising a set to examine as any we could think of.

The results of the survey generally indicated that private institutions were in much the same posture with respect to innovation as public institutions. Briefly it was found that:

1. Private institutions seem not to be run more efficiently than public institutions. Since they are mostly totally dependent on tuition for their financial support, they find it difficult to engage in long-range budget planning or in even rudimentary cost-benefit analyses because they do not know how many students they will have until the day of enrollment.
2. The very smallness of their student bodies, while an undeniable virtue from another standpoint, limits opportunity for innovation. There simply are not sufficient funds to invest in innovation.
3. Private institutions are under much the same pressures to avoid radical innovations from parents as public institutions are from governmental agencies.
4. Private institutions are considering much the same kinds of innovation as public institutions.

The survey consisted of face to face and telephone interviews of a senior administrator of each institution studied. In the interest of making the survey manageable, certain institutions whose interests were judged to be narrow were excluded. Types of schools omitted were those that grant diplomas or certificates instead of degrees; theological seminaries and Bible colleges, though the Graduate Theological Union was included; professional schools without university affiliation; and schools of fine arts and music. Fifty-seven institutions were included in the study. The findings are discussed under the headings of Student Admissions, Faculty Concerns, Curriculum, Facilities, Finance, and General Administration.

STUDENT ADMISSIONS

A major change in sources of students confronts many private colleges and universities in California. With two-year college enrollments approaching three quarters of a million students and with a growing percentage of the students interested in transferring to a four-year institution, enrollment in private colleges and universities cannot help but become more dependent upon these transfer students. This survey has revealed no definite evidence that freshman enrollments in private institutions are shrinking because of the popularity of the two-year colleges, but a few report an unplanned leveling off of enrollment which may prove significant.

The institutions that have stressed recruitment from two-year colleges report very encouraging results. The inclusion of the independent colleges with state and community colleges in the California Articulation Conference (which is concerned with transfer of students from one segment of education to another) should prove beneficial to all independent institutions interested in recruiting from the two-year colleges.

The private institutions must recognize that there are reasons other than proximity and cost entering into student preference for the two-year colleges. Some of the community colleges in large urban areas have large enrollments, but many of them, not all in remote areas, have small enrollments and can afford the same individual attention and the same sense of community that are the strengths of the smaller, private colleges and universities.

In part, because of the changing sources of students, but also because of their recruiting efforts, the private colleges and universities in California, along with nearly all institutions of higher education in the United States, are accommodating larger numbers of disadvantaged students, particularly Black and Mexican-American students. Most of the institutions in this survey have taken steps to assist these minority students. They have made curricula more relevant by including ethnic materials in courses and creating special programs; they have taken advantage of the federal educational opportunity programs (by decision of the legislature, most of the educational opportunity grants in California's program went to students in the community colleges). They have established programs to overcome educational and cultural deficiencies in addition to providing some forms of financial assistance; some of them have relaxed their standards of admissions requirements, substituting for them various forms of probation.

A few institutions have pre-college programs that have served over the years to overcome deficiencies that have prevented high school graduates from entering college or from being admitted to programs with high requirements as in mathematics and science. United States International University operates a separate campus for such students. Northrop Institute of Technology has an engineering preparatory program consisting of twelve weeks of full-time study of algebra, geometry, physics, chemistry, and English composition. The Institute has received support from the Sloan Foundation for a "First Step" program that seeks students who are disadvantaged both educationally and economically but who possess the potential and desire necessary to complete an engineering program. These students are supported financially through the engineering preparatory program. To date, an encouraging number of them have matriculated in engineering. They have proven both to the Institute and to themselves that they can handle the work.

A third area of change relating to students lies in the concept of taking the educational opportunity to the student. Unlike the University Extention program, the programs of the private institutions are usually offered for credit; some are full-fledged degree programs. For some years, both Chapman College and Pepperdine College have offered continuing education at the graduate level, primarily for public school teachers. Pepperdine, for the most part, offers its courses in public high schools. Chapman conducts its programs on military bases, where it also offers upper division courses for students from nearby junior colleges, thereby enabling them to complete work for the Bachelor's degree by merely taking some intensive seminars on the Chapman campus afterward. The University of Southern California offers graduate programs in aerospace management at military bases around the world, Golden Gate College also offers its MBA program at a number of bases. Golden Gate is, moreover, involved in an experimental program with the Bechtel Corporation. The MBA program is offered at Bechtel headquarters, and the ultimate objective is to offer the program anywhere in the world where the company has a concentration of management personnel.

For the past two years, Stanford University has been offering a unique program based on its long-standing arrangement with nearby companies to permit qualified employees to participate in an honors cooperative program. Under this program, students have been accepted on a part-time basis (a privilege otherwise extended only to Stanford University employees) to work for graduate degrees in engineering, the sciences, and computer science. Two years ago, arrangements were made for some of these students in graduate programs in engineering to attend regularly scheduled classes by closed-circuit television. Receivers were installed at their worksite. A radio link enables the student to ask or answer questions. The student pays the regular tuition and his company pays an equivalent amount directly to the department offering the course.

Because this use of equipment is limited to daytime hours, the 18 companies that participate in the program have formed a continuing education association that uses the facilities to offer in-plant type training programs and leases them during free hours. The association is working with nearby colleges in order to offer selected undergraduate courses and is negotiating with Golden Gate College to offer the MBA program at night.

There have been two interesting by-products of the Stanford program: (1) in the past, auditing of courses has been limited to Ph.D.'s, but others are now welcome to audit where they work; they are required to pay the regular fees; (2) Stanford has now made a non-registered option available to interested employees of companies in the association: if a student's college grades do not qualify him for admission to graduate study he may take three or four courses by television. So far as the instructor is concerned, he is a regular student, but his records are kept by the Association. If he makes A and B grades in these courses, he may be admitted to the University as a graduate student and may then petition to have the already completed courses apply toward his degree. Under this arrangement, the student pays the fee to the department for each course he takes; then he pays tuition to the university when his credits are accepted.

FACULTY CONCERNS

Not too surprisingly, innovation in the area of hiring faculty is negligible. There are efforts to employ minority faculty and administrators but these have enjoyed limited success because qualified people are still in short supply.

Financial problems facing higher education in general have, perhaps, resulted in the most significant possibility for innovating. Limited finances are forcing many institutions, including many private colleges and universities in California, to examine closely the economics of the instructional process. Thus, after many years of simply going along with most proposals that met with faculty approval, institutions of higher education are being compelled to take stock. As a result, they are beginning to assess the merits of small classes, proliferation of courses, and low student-faculty ratios.

CURRICULUM

Changes in curriculum, by contrast, have been so numerous that they are impossible to cover in detail and are very difficult to isolate and define.

However, several generalizations are possible. There is much experimentation. There has been a general relaxation of requirements for graduation, particularly in lower division or general education programs. There has been widespread adoption of calendars different from the traditional semester or quarter calendars.

Among curricular changes, the strongest trend appears to be toward placing the responsibility for learning upon the student by offering him more opportunities for study away from the campus and for diminished faculty supervision on the campus.

It is predictable, but still interesting, that there is less curricular change on campuses affiliated with conservative churches. Many of the more liberal church-related institutions are changing so rapidly that the differences between them and the more innovative secular institutions are becoming difficult to detect.

Inclusion of minority studies in the curriculum appears to be more a matter of institutional size than conservatism or liberalism. Smaller institutions tend to incorporate materials into existing courses; slightly larger ones initiate ethnic courses; finally, the largest institutions have curricula and entire departments or divisions devoted to ethnic studies.

One innovation outside the private colleges and universities of California may eventually have an impact on their engineering programs. California Polytechnic College at San Luis Obispo, Brigham Young University and Oregon Technical Institute have introduced programs leading to the degree of Bachelor of Engineering Technology. These programs are characterized by a greatly reduced mathematics content. Cogswell Polytechnical College (a private two-year institution) reports a sharp increase in the numbers of its graduates transferring to these institutions since these programs have been introduced. Northrop Institute of Technology offers a Bachelor's degree in Aircraft Maintenance Engineering Technology, but the program is not characterized by greatly reduced mathematics content.

Foreign study programs involve much more than curriculum but are probably best discussed here. The traditional "junior year abroad" programs continue, some with interesting variations. There is a growing tendency to permit the student to spend some part of his undergraduate years as a regular student in a foreign university, provided he has the language facility that may be needed. Opportunities for students to do research "on their own" in foreign countries are also developing. Some of the foreign campuses are operated by the parent California institution; others are located at and operated by the foreign institution.

Particular mention must be made of World Campus Afloat, administered by Chapman College. This program, combining classes on board ship with visits to cultural centers en route, has been in operation for five years. During the term just ended, 450 students from 200 colleges and universities were enrolled. There are two cruises each year, with the fall cruise visiting the Mediterranean and Latin America, and the spring cruise visiting Asia and Africa and continuing around the world.

Much of the experimentation with calendars relates directly to the increased opportunities that one-month or six-week "interterms" provide for foreign travel. After the conventional semester and quarter calendars, the 4-1-4 calendar has become the favorite, particularly if one includes the variations on it. The 4-1-4 has the virtue of maintaining some of the more leisurely pace of the semester system and has the quarter system's advantage of placing the Christmas vacation between terms. So far, this has been more popular in Northern California, but it is beginning to emerge in Southern California institutions.

FACILITIES

Many of the private colleges and universities of California were in a position to take full advantage of the Federal grants and loans under the Higher Education Facilities Act. As a result, most institutions that have attained their enrollment targets, or find that they are no longer growing, are reasonably comfortable so far as physical facilities are concerned. The few institutions that were not in a position to take advantage of the

Federal programs and those that are still growing, in some cases more rapidly than anticipated, are having difficulty financing the additional facilities that they need. High interest rates and the general shortage of lendable funds are part of the problem, while the depressed prices of securities is another part, for tax laws do not give donors attractive tax advantages for gifts of depreciated securities. The rising costs of building are painful but are probably not significant in deferring needed construction; there is a general belief that building prices will continue to rise indefinitely in the future.

Apart from interesting examples of innovative architecture on campuses today, some significant new concepts have emerged in the facilities area. While trailers of one kind or another have been used as temporary dormitories on many campuses, Stanford University has gone a step beyond and installed a cluster of mobile homes very near to the center of campus to fill an urgent need for housing for some 500 students. Stanford intends to use these units for five years until a permanent solution can be developed. Azusa Pacific intends to follow Stanford's lead in using mobile homes for student housing, but plans to install them in a fully developed park-like area adjacent to the campus and make them a permanent part of the campus. The introduction of coeducation at Saint Mary's College has created a housing problem and mobile homes are under consideration there as well.

Campus administrators are being buffeted by a kind of tidal action at some campuses. Students ask to be permitted to live off campus. This can create a problem of surplus housing on campus or it can ease a shortage. But if many students move off campus, available housing disappears in the neighborhood and some of those who have moved off then want to return to campus to be with their friends or to get away from housing conditions not to their liking. Until this back and forth motion has run its course, those responsible for planning campus housing are in a tenuous position. Because campus housing produces revenue, funds for its construction can be obtained, but if a vacancy problem develops, there is insufficient revenue to meet interest and amortization requirements. On the other hand, enrollment suffers if housing is not available for those who want it.

Other kinds of facilities are receiving attention. Chapman College is studying the feasibility of an Educational Corridor, which will consist of a group of two-story buildings grouped around a mall. The buildings could include dormitories, a student center, an art center, a swimming pool, a shopping center, etc. The innovation lies in the idea of building the Educational Corridor on the athletic field and then using their roofs as a base for an athletic field that could be rebuilt on top of them.

FINANCE

We have already touched on finance in connection with new facilities. To the observations made there, we must add that along with current business conditions, campus unrest is contributing to the financial problems of higher education. It is difficult to determine which factor is more significant if only because people who might give to higher education if market conditions were better will sometimes state that they are not giving because of campus unrest, rather than admit that they are embarrassed by some of their investments.

One area in which campus unrest is contributing directly to the financial problems of higher education is in the cost of insurance. Contracts are now being written for one year instead of three; rates have been increased, in some cases by several hundred percent; and deductible amounts have been raised, again by several hundred percent in some cases. Some insurance managers feel that insurance companies are overreacting, but some sharp increases on some campuses are inevitable as long as unrest remains destructive.

To offset costs, as we have already noted, a number of institutions included in this survey are taking a hard look at the economics of the instructional process in an effort to bring costs more into line with anticipated income. Fairly drastic action may prove necessary in the areas of student-faculty ratios, class sizes, and the richness of the curriculum, particularly if the current inflation persists.

Some private institutions are beginning to think in terms of the patterns of financing that existed before World War II. At that time, the normal practice was to cover operating expenses with tuition and endowment income (if any) and to solicit gifts to cover capital and extraordinary expenses and to build endowment. Under that arrangement, new buildings were the equivalent of costs, and no provision had to be made for interest payments or for amortization.

In recent years, largely because loans became available under the Higher Education Facilities Act, but also because colleges and universities have been making greater use of bank loans, provision for interest payments and amortization of loans has become a significant item in the budget of many insitutions. One result of this has been an increased emphasis on gifts for current purposes, completing a significant departure from pre-World War II days.

But there has been another reason for an increased emphasis on gifts for current purposes: tuition charges have gone up but much more slowly than costs in most institutions, leaving an increasing gap to be filled by gifts. Some fear that tuition levels have reached a point where private institutions are being priced out of the market; there is evidence that this fear is justified elsewhere, but enrollments in private colleges and universities in California appear to be unaffected by tuition increases. More significant is the operation of the law of diminishing returns with respect to tuition increases: as tuition increases, more students qualify for financial aid and gains in the income account are offset more and more by increases in the student aid budget.

The loss of gift income because of current economic conditions (and campus unrest) is forcing a re-evaluation of tuition policy. Institutions that once reluctantly increased tuition every three years now have annual increases and have published this policy to students and their partents. Institutions that have prided themselves on keeping tuition low are recognizing that the conditions that enabled them to keep tuition low are changing or no longer exist. The increased proportion of secular faculty in Catholic institutions is a case in point. Institutions that have been holding tuition under $1,500 are coming to realize that they must raise it to $1,800 and that, by the time they get there, the magic number will have gone to $2,000.

Endowed institutions have somewhat more flexibility in the matter of tuition, but there are only about 10 private institutions in California that have significant endowment funds. So long as their stocks are in companies that are maintaining dividends, their endowment income should not suffer too much from the current depressed prices of securities. They can be hurt, though, if they must liquidate unrestricted endowment funds in order to meet operating deficits.

Many of the endowed institutions also have significant life income and annuity funds. In the present market, the life income funds present no great problem because the donor has, in effect, accepted the risk of reduced income from the securities he has given. Annuity contracts are a different matter and can hurt the institution if the annuity rate has been set too high and earnings on the portfolio decline.

Many of the endowed institutions have taken seriously the recommendations of the Ford Foundation study that was completed about a year ago. The study recommended greater diversification of endowment portfolios into equities with the objective of seeking an annual yield on the order of twelve percent and the adoption of a policy of transferring a fixed percentage of the value of the endowment to the operating budget each year in order to protect operating income against wide swings in endowment income. Because bond prices have also suffered, institutions that have moved in this direction profess not to be overly disturbed by the decision to go into equities.

Most institutions have benefitted by the high interest rates obtained by investing in short-term securities. Tuition payments are made, anywhere from two to four times a year. However, they are spent throughout the year, thus giving most institutions opportunities for investment. For most institutions, though, investment profits are not significant and administrators are forced to conclude that tuition is the only controllable variable in the financial equation. Faced with the risk of bankruptcy against that of pricing themselves out of the market, most institutions are going to adopt the latter risk. The imposition of tuition at the University of California and the increases in tuition for non-residents at the public institutions of adjacent states ease the risk of tuition increases in private colleges and universities of California, and continued escalation may be expected.

There is, of course, the possibility that public funds, both federal and state, in support of private higher education will be increased or even that some funds now going into public education will be diverted to the private sector. Thus, funds for higher education may be restored to former levels in the federal budget, but this seems unlikely in view of the attitudes expressed by some Congressmen because of campus unrest. Perhaps the California State Scholarship program will be expanded to increase the dollar limit above the present level of $2,000, or to increase the number of recipients each year above the present number (equivalent to two percent of the preceding year's high school graduates); the Governor vetoed a bill to do the latter last year. Perhaps the current campaign to amend the State Constitution to make possible public support of private higher education will be successful. Inasmuch as Proposition I, to provide funds for additional construction at the medical schools of the University of California, was defeated in a recent election, a constitutional amendment could lead to diversion of some funds from the public medical schools to the private ones in order to increase the production of doctors in the State. These alternatives, other than some increase in the State Scholarship program, are rather slender reeds on which to base financial planning among the private colleges and universities in California.

GENERAL ADMINISTRATION

This section could perhaps have been labeled "Everything Else," inasmuch as general administration is defined to include organization.

If imitation may be taken as a measure of value, a good case may be made for the concept of the cluster college as the greatest innovation in higher education in California, if not in the United States. The idea was born in 1926 when Pomona College, founded in 1887, was joined by Scripps College (1926) and the two initiated the Claremont University Center and Graduate School. The remaining institutions were added after World War II: Claremont Men's College (1946), Harvey Mudd College (engineering, 1955), and Pitzer College (1963). The School of Theology at Claremont is an associated institution and, until recently, the colleges expected Immaculate Heart College to join them, also as an associate.

The unique feature of the Claremont Colleges is that each is an independent institution with its own governing board and separate finances, administration, and faculty. The strength of the arrangement lies in the development of a common library far richer than any one of them could afford individually; in the use of common business services, common student health services, common faculty center, etc; in the arrangement for cross-enrollment of students; and in the concentration of graduate studies.

This independence revealed certain weaknesses when campus unrest developed and united action was required because the students involved in the disturbances could move from one campus to another and, therefore, from one jurisdiction to another. This problem has led to an examination of areas in which common administration should be established. More recently, rising costs have led to a decision to explore additional services, such as catering, that may be made common among the six institutions to the benefit of all.

Cluster Colleges

One more item will illustrate another way in which these six institutions, each quite small, gain strength from their affiliation as the Claremont Colleges. When agitation for the establishment of ethnic studies reached its height, by approaching these demands as a problem common to all of of them, the Claremont Colleges were able to establish a Human Resources Institute made up of a Black Studies Center, a Mexican-American Studies Center, and a Center for Urban and Regional Studies---a strong contrast to the smaller colleges which could only incorporate some ethnic material into existing courses or add some courses.

One of the early emulators of the Claremont concept was the University of the Pacific. Around the College of the Pacific in Stockton, there is a cluster of three liberal arts colleges (each with a different mission), a school of engineering, and a school of pharmacy. In addition, the University has a dental school in San Francisco and a law school in Sacramento. The obvious way in which the University of the Pacific differs from the Claremont Colleges is in its being a single institution with a single governing board. In other respects, it draws the same strength from the cluster concept as the Claremont Colleges.

Another imitation of the Claremont concept dates back to the 1940's. When the San Diego College for Women was established, the University of San Diego was built adjacent to it with a college for men and a law school. The women's college, separately incorporated, became known as the University of San Diego College for Women. The College for Women is now in the process of merging into the University and this, at least officially, will end the cluster arrangement.

More recent developments of the cluster concept include the Graduate Theological Union at Berkeley. It is almost identical in concept to the Claremont Colleges except that the Union does not yet make common business services available to its constituents. The move of Marymount College to the Loyola campus creates a similar, if more limited, arrangement. In establishing Johnston College, the University of Redlands is following the model of the University of Pacific.

A major variation on the cluster theme has been developed by those institutions with a single administration and multiple campuses where the campuses are geographically separated. United States International University operates three campuses in the San Diego area, Loma Linda University now operates two campuses in the Riverside area as a result of merging La Sierra College, and Pepperdine College has broken ground for a campus in Malibu to go along with its main campus in south-central Los Angeles.

Another variation of this latter theme may be noted. Mount St. Mary's operates its Doheny campus in downtown Los Angeles and Marymount College operates a junior college at its former location on the Palos Verdes Peninsula. The major distinction in these two cases is that the satellite campuses do not mirror the programs on the main campus.

In summary, we may say that all applications of the cluster concept, including those at the San Diego and Santa Crúz campuses of the University of California, aim at the strength that comes from larger size while maintaining the feeling of individuality and the sense of community that characterizes smaller colleges.

Other Cooperative Arrangements

Despite the success of the cluster concept, other cooperative arrangements have had no visible success among the private colleges and universities of California. The Independent Colleges of Northern California and the Independent Colleges of Southern California are fund-raising organizations and do not require sharing of services in the usual sense.

The kind of cooperation for which there should be opportunity among the private colleges and universities of California is exemplified by the informal association of which California Institute of Technology, Carnegie-Mellon University, Case Western Reserve University, The Johns Hopkins University, Massachusetts Institute of Technology, the University of Rochester, and Washington University of St. Louis are all members. These institutions have in common small student bodies, a high cost per student, and a heavy involvement in research. The provosts meet regularly and other officers meet on occasion; one subcommittee, on administrative data processing, has been formed, partly out of concern that national efforts like those of the Western Interstate Commission for Higher Education may produce data and cost concepts that are unrealistic for institutions of this type.

At another level of organization, that of governance, there has been a great amount of change among private institutions in California, but there are also some strong central tendencies. With minor exceptions, there is agreement that students do not belong on governing boards and that alumni representation should be widespread. With more exceptions, there is agreement that faculty members do not belong on governing boards; though several institutions have appointed faculty members from other institutions to their boards in order to have a faculty point of view represented. Participation of faculty and students in committees has become widespread, with some representation on committees of the board, more on administrative committees, and still more on lesser committees. As an alternative, some board meetings and some committee meetings are open to faculty and students or their representatives. Almost without exception, colleges and universities have acted to establish new lines of communication so that student interests and concerns can be expressed.

In a few church-related institutions, there are highly visible efforts to effect some separation from the church involved (hopefully, without loss of financial support). Among Catholic colleges, this expresses itself as a separation of the institution and the controlling religious order into district corporations, accompanied by the addition of laymen to the Board of Trustees of the educational institution. Part of this attempt at separation is designed to broaden the base of support of the college or university, part of it stems from a hope of avoiding strictures on use of public funds in support of private higher education when a sectarian religious purpose is served by the institution.

Problems of Planning and Budgeting

At the purely administrative level, there are three areas of interest: computers, planning and budgeting, and the use of contracted services. Roughly half the private colleges and universities are involved with computers, whether in teaching courses on computers, teaching courses in which the students are expected to use computers, operating computers for teaching and research, or operating computers for administrative purposes. The variety of computers involved renders any effective cooperation, particularly in the area of applications programming, almost impossible. The result is that few of the small institutions are getting the magnitude of benefits possible from the computer. Particularly for the smaller institutions, there is a real need to adopt uniform procedures of admissions, registration, recording, and reporting as they pertain to students; in charts of accounts receivable and payable, reporting and fund accounting; and in methods of keeping basic statistics. If there were uniformity, computer programs could be developed at minimum cost to each institution. A service bureau operation might prove appropriate for groups of these smaller colleges.

In the area of planning and budgeting, considerable progress has been made. Most private colleges and universities now go through the annual agony of preparing a budget. Fewer of them relate this budget to any overall plan designed to move the institution toward its objectives; still fewer have developed meaningful controls that force expenditures to respect the budgetary mold.

Admittedly, long-range planning is very difficult in the current environment. Private institutions are still growing in California but the combination of inadequate financial resources and campus unrest tends to offset the enthusiasm for the future that growth normally brings. Inevitably, many institutions feel that they are in a battle for survival and feel that they cannot spare the energy to look ahead--even when looking ahead would put the present in a more hopeful perspective.

The development of adequate budgeting controls is even more difficult. Enrollment forecasts and budgets are prepared early in the winter, personnel contracts are negotiated in the spring, student acceptances come in during the summer, and the students appear--or fail to appear--in the early fall. A slightly low estimate of enrollment usually creates little or no problem, except that there is a tendency to ease some cuts that may have had to be made in the budget instead of establishing a reserve. A large error on the low side in estimating enrollment can create problems of overcrowding in classrooms and dormitories, and can lead to panic actions--almost always expensive--unless there is a plan for coping with such contingencies.

Because of the heavy dependence of practically all private colleges on income from tuition and income from full dormitories, even a small overestimate of enrollment can create severe problems. Ten missing students represent a short income of $25,000 to $35,000 in tuition and room rental on a typical campus and this can be a serious blow to a budget in a smaller institution. In some ways, a larger overestimate of enrollment is better than a small one if it makes possible a reduction in the number of sections of courses required and the closing off of part of residence hall in order to save maintenance costs--provided, of course, judicious use is made of contingent faculty that can be dropped when there is an unplanned drop in enrollment.

Even when enrollment forecasts are completely accurate, budgetary control is difficult in colleges and universities because so many of the expenditures against budget allocations are small: library books, a few hours of extra work for a deserving student, attendance at meetings and conventions, especially when nearby, failure to collect a loan that has already been pledged to another student. The list goes on to infinity and there is ample justification for additional expenditure in areas such as these. When they are aggregated, however they can push a budget completely out of control,

There would appear to be a need for a form of flexible budgeting, complete with contingency plans, for smaller colleges and universities. Methods of aggregating smaller items that force tradeoffs within the aggregates ("If you want extra work for this deserving student, you must deduct your travel allocation by an equal amount") would also be helpful.

Some institutions have sought greater budgetary control by making judicious use of contracted services. The use of banks to prepare payrolls is probably the most common example, unless one includes auditors, which nearly all colleges and universities use even though there is no legal compulsion upon them to do so. At the other end of the scale of utilization, outside services for the maintenance of buildings and grounds are rarely used, largely because these are areas in which students can be employed.

Food service appears to be the most controversial area among private colleges and universities in California at present. Some institutions are adamant in their refusal to let outsiders have anything to do with feeding students; others have "always" used a food service and would not consider doing it themselves; few have dropped the outside service in favor of handling the problem for themselves. Every year, a few change services or decide to bring one in. In short, it is difficult to find a neutral observer who can give an objective appraisal of the issue.

There is a general reliance upon professional investment advice among those institutions with appreciable sums available for investment. Perhaps as many as half of the institutions that administer National Defense Student Loans use one of the available processing services to handle billing and collection. About the only other area of contracted services worth mentioning is the rather limited use of the service bureaus for data processing.

There are, of course, highly localized services, including contracts with clinics or individual physicians to provide medical services. Most of the remaining outside services that could be mentioned bear directly on the educational process.

The basic question that is raised by discussion of contracted services is this: Should the president of a college or university be selected because he is a competent educator or because he is a competent general manager of a highly complex business operation? If the former, it would seem that he should be relieved, as far as is humanly possible, of his duties as innkeeper, caterer, landscape gardener, etc. One way to do this is to use contracted services, another way, perhaps, is to hire campus administrators who are responsible directly to the board of trustees, thus freeing the president to concentrate on the educational mission. The number of resignations (as opposed to retirements) among presidents indicates a need for some fundamental innovation in this area.

CHAPTER 25

THE COMPUTER IN HIGHER EDUCATION

INTRODUCTION

Higher education today is under much pressure as a result of increased demand and rising costs. Educational demand is increasing with population growth and the consequent rise in the number of eligible applicants, the increase in the average number of years students spend in college, the proliferation of adult and continuing programs, increased government support to students who otherwise would be unable to attend college, and increased pressures for programs serving minority and remedial students. Similarly, educational costs have risen. For the average college student, annual costs have increased from $1,495 in 1955 to $2,164 in 1965; $2,557 is projected for 1975.[1] Faculty and staff salaries have likewise increased, partly as a result of competition with industry for well-qualified personnel.

However, neither the productivity nor the efficiency of higher educational institutions has changed appreciably in the past decade. If these trends continue, the result can only be continuing increases in operation costs. Costs of higher education have been increasing at over $1 billion per year. The annual rate of increase is estimated to be 7.5% for private schools and 5% for public institutions.[2]

The Association of American Universities reported in 1968 that unless additional resources can offset the cost increase, higher education will be cut back--perhaps toward fewer students, fewer teachers, and no assistance for the disadvantaged.[3] Meanwhile, there appears to be a clear trend on the part of government and public to reduce rather than increase financial support to higher education. There seems to be no reversal of this trend in sight, especially since reduced aid to higher education is now seen as a punitive measure to combat campus revolt.

Against this background of crisis, educational technology may have much to offer. Jerome S. Bruner has said, "Instruction is a provisional state that has as its object to make the learner or problem-solver self-sufficient."[4] When students use technology to master course material, the instructor's released time can be advantageously spent discussing basic concepts and diagnosing difficulties.

The knowledge explosion of the 20th century has made it almost impossible for any one man to become an authority outside of one very specialized field. Speed and efficiency - implicit in this technocratic age - are becoming important values. A student cannot have quick access in his mind to a large body of knowledge; there are limitations to his memory; there are virtually no limitations to a computer's memory. There is no need to spend useless hours practicing routines of search and drill when there are machines for that purpose; the computer provides instant retrieval. However, notwithstanding its vast potential for furnishing time and effort-saving devices, it remains primarily a tool to aid in learning. The computer has virtually no physical limits in terms of memory size and complexity, but it has quite finite limits in terms of function, since it is a machine programmed by man.

Computers have been used at educational institutions for quite some time to handle administrative chores such as admissions, course registration and grading procedures, and also to carry out computations for research workers. They have, thus far, been very little used to assist the major function of educational institutions: instruction. It would seem appropriate now for education to explore all possible uses to which computers can be put for aiding instruction.

Ordinarily it would seem a little odd to assume that one must look around for a use for a gadget; the computer does seem to be a special case because it is so effective for storing and retrieving information. However, the problem of determining how computers can be truly useful, beyond being a very convenient computing device, is one which is not yet entirely solved.

BACKGROUND

Computer teaching evolved as an outgrowth of programmed textbooks and teaching machines. As educators became more experienced with programmed materials, they found limitations in the method. These linear programs were set up so that the sequencing of frames (questions and responses) were fixed in serial order, thus not allowing for individual differences.

The more flexible computer allows branching to a variety of sequences depending on the student responses; this advantage is the heart of computer-assisted instruction (CIA). The development of hardware (the actual physical machinery) and software (programming) for this application of computers began in the late 1950's and early 1960's. One of the earliest efforts was the PLATO (Programmed Logic for Automatic Teaching Operations) program headed by D.L. Bitzer at the University of Illinois. Beginning in 1961 with a single terminal in conjunction with an ILLIAC I computer, a computer-instruction logic was developed, employing the CATO language. The next year another terminal was added to the system, using a time-sharing mode with a CDC 1604 computer. The following year there were 20 terminals. Realizing the role of console costs in future systems, PLATO began a research and development program to produce a new low-cost console display unit. The resulting hardware is expected to be commercially available soon.

The IBM 1500 was introduced in 1966 for CAI purposes; it has specially designed terminals with a keyboard, cathode-ray tube and light pen, and uses the COURSEWRITER II language.[5] It has a capacity of up to 32 terminals. A filmstrip projector and audio-tape playback unit with adapter are available for it. More than a dozen of these systems are currently in use at universities.

Experimental work conducted at Systems Development Corporation resulted in a random-access slide projector and viewer as the console of a teaching system known as CLASS. A student's response produces a computer response of a number in a simple display. The student selects the slide with that number on it for the next instruction.[6]

Bolt, Beranek and Newman, Inc. has marketed a terminal equipped with a double keyboard, oscilloscope, and two plug-in amplifiers. This terminal is connected to an IBM 360/65 time-sharing computer. Preprogrammed subroutines exist, enabling a student to combine the basic subroutines to fit his own needs.

The University of California, Santa Barbara uses the Culler-Fried system of interactive programs. The computer is programmed for the on-line (i.e., direct, immediate access to the machine) solutions of problems. Answers are shown at remote terminals on a TV-like screen. Through a telephone-microwave transcontinental hook-up, students at Harvard, the University of Kansas, UCLA, and the Lawrence Radiation Laboratory share the system.[7]

Much of the early work in CAI was done using teletypewriter terminals. The typrwriter is a slow output device, and, consequently, the use of the cathode-ray tube display has increased and has been supplemented with slide and/or movie projection, instructional television (ITV) displays, and audio facilities.

The time-shared console is predominant among CAI systems, accounting for 15% of all computer sales, and is predicted to be 60-70% of the market by the mid-1970's.[8] Time-sharing allows concurrent, effective use of one computer by multiple users, which is more efficient than each school obtaining its own computer. The largest is at Dartmouth with 120 users.

A compendium of CAI research and activities follows.

USAGE

Individually Prescribed Instruction

The greatest benefit of the computer is that it allows the student to study at his own level and pace. The Learning Research and Development Center at the University of Pittsburgh is working in conjunction with the Oakleaf Elementary School on a program to implement self-paced learning.[9] First, the curriculum is defined in terms of specific objectives: there are 400 math objectives for grades 1-6 grouped into 80 instructional units. Criterion-referenced tests are administered to locate the student with respect to the curriculum rather than to his classmates. At the Oakleaf School, there is an IBM 1050 terminal with typewriter and card reader, on-line to the University's time-sharing system which uses an IBM 360 Model 50. The students' files are stored on disks at the central computer and test results are transmitted to the central computer via punched cards. The students' scores are computed with reference to the criterion objectives.

Drill and Practice

The computer has a virtually limitless memory and can easily be adapted to a student's needs. Patrick Suppes of Stanford says, "It can be programmed to follow each student's history of learning successes and failures and to use his past performances as a basis for selecting the new problems and concepts to which he should be exposed next."[10] The Central Computer System at Stanford makes drill and practice exercises available to 5,000 elementary students throughout the country. Two hundred classroom terminals are linked by telephone data lines to the computer center. The computer relies on memory units to supply the requested exercises in less than 1/2 of one-millionth of a second.[11]

Tutorial

The computer can be used as a highly flexible programmed textbook, using the student's last response to decide what to present next. At the State University of New York at Stony Brook, the computer-instruction system is set up so that a student's response is not labeled "wrong." If the computer does not recognize the response, it either gives the correct answer or supplies a hint. If a student has difficulty, the machine may request that he repeat the unit. The student also has an option to give up, whereupon the computer will give the answer.[12]

Dialogue

A system is being developed at the University of Michigan to convert spoken words into computer-recognizable impulses.[13] The computer would then compare impulses with norms previously programmed into it and thus have the capability to "understand" spoken questions and answers; it would then interact more naturally with school children in the early grades. This system has not been perfected yet.

Games or Simulation

The computer can provide realistic practice for developing decision-making skills. Many schools of business administration use simulations of business enterprises in competition with each other for instructional purposes. The simulations permit students to take the roles of various executives in the forms and make decisions very similar to what they would in real firms; the outcomes of their decisions are realistically reflected on the fortunes of the fictitious firms they are managing.

Computation

The computer is tremendously time-saving in the solving of math, physics, engineering, and statistical problems, allowing the student to handle much more complicated and realistic problems than he could otherwise. Additionally, the computer can assist the student or instructor to check each step and indicate where errors were made.

Laboratories

The computer in a science laboratory can be used to a) present the problems to be solved and verify responses; b) provide references and obtain data, as the student attempts to solve a problem; c) simulate characteristics of experiments when size and cost limitations prevent carrying out real experiments.

Testing, Recording and Processing Student Performance

The title is self-explanatory. With its extensive memory, the computer can be used as a filing system, can process scores quickly, and can use scores and criteria to serve a variety of diagnostic and administrative procedures.

Curriculum Research

The computer provides a memory bank for the collection of data. Suppes says that a computer can "provide daily information about how students are performing on each part of the programmed curriculum as it is presented, making it possible to evaluate not only individual pages but also individual exercises."[14]

PRESENT UTILIZATION

The amount expended for computer uses in colleges was $103 million in 1965, with $276 million estimated for 1969.[15] There were 900 computers at 600 universities in January 1966, with 1,200 computers at 900 higher education institutions projected for January 1969. Obviously usage is growing at a rapid rate.

The President's Scientific Advisory Committee Panel on Computers in Higher Education found that approximately 35% of college undergraduates are enrolled in courses in which the introduction of CAI would be an improvement. Another 40% are in curricula for which introductory computing training would be useful. The remaining 25% could make use of computers in one or more courses during their college careers.[16] Computer instruction could also be useful in helping the junior college transfer student adapt to the four year institution and in aiding the student who has changed majors to catch up with the required material.

The computation, research, gaming, and processing functions of the computer are widely used and accepted. Opposition has come mainly from students who are fearful of the possible dehumanizing effect of computers and faculty members who are fearful of being replaced by computers in functions such as lecturing. Studies seem to indicate that when CAI is compared to conventional methods in the tested courses, CAI is either superior or at least equal to conventional teaching.[17] Although most of the testing has been on the primary school level, the favorable reactions are important to note in that these young students are tomorrow's college students. Whether faculty and administrators' reactions are favorable or negative seems to have no significant effect on student learning.

The teacher's role with CAI is altered. The teacher must perform managerial and strategy functions in sequencing and evaluating. Since the computer handles negative responses to the student, the teacher is less a corrective force, but he must have a greater involvement in guiding individual students and diagnosing their difficulties. The teacher must use a wide range of techniques to stimulate class discussion and to encourage interest in the computer programs.

Still in the formative stages, but of great potential is the Task Force on Information Networks of the Inter-University Communications Council (EDUCOM). EDUCOM was initiated to promote technological aids to instruction, technological aids to the learner (self-instruction), technological aids to research, and the application of technology to administration. The purpose behind EDUCOM is to free faculty from that part of the job of teaching which can be better done by machine. EDUNET, the related information net-work, was created to provide television communication among institutions of higher education. There are now some one hundred members of EDUCOM and it is expected that every college and university will belong eventually. EDUCOM has been well received and once the legal debate on interchanging programs is solved, considerable growth will doubtless occur. A revised copyright bill covering software has been prepared, including a provision for the establishment of a Commission of New Technological Uses of Copyrighted Works.[19]

COSTS

The greatest obstacle to the mass adoption of computers is their cost. A school must determine exactly what it wishes to accomplish with a computer before an accurate rental charge can be quoted. The more terminals that are used, the greater the costs. An IBM 1500 with 32 terminals costs approximately $15,000 a month. In general, monthly rental fees range from $500 to $31,000 and upwards, depending on the operating systems.

E.N. Adams estimates an IBM 1500 system costs $3 to $5 per student per hour.[20] Systems using a teletypewriter terminal on a time-sharing basis is at the $3 per hour level, compared to the $2.75 costs per hour of standard college classroom teaching.

The 1968 report of the Committee for Economic Development concludes that an investment of $9 to $24 billion a year would be necessary to provide every secondary and elementary student with one hour of CAI daily.[21] The estimate was based on a 1968 enrollment figure of 53 million students and 150 annual school days making a total of 7.8 billion CAI hours. CAI would cost $1.15 to $3.08 per student hour, six hours a day, 150 days a year. More students using the computer for more hours will lower the average cost per hour.

Ralph W. Gerard of the University of California, Irvine has estimated that there will be 70,000 computers by 1975. In ten years, computers will be a thousand times more powerful, completing 109 operations per second at 1/200th of the present cost. Presently there are huge computer memories able to contain most of the information in all the libraries of the world.

Costs of preparing programming for CAI have been estimated at $4,000 to $10,000 per hour. However, software costs, if the software is widely used, are small compared to hardware costs. Gerard estimates that 100 lower division college courses, covering the entire curriculum, could be put on CAI for about $3 million.[22]

Donald Bitzer of PLATO is attempting to reach the goal of 25 to 30 cents per student hour to match the 30 cents per student hour cost for conventional instruction in elementary schools. Bitzer writes:

> The average processing time needed to fulfill a student's request has been determined from this data as 20 milliseconds. Our present computer (CDC 1604) is capable of processing 50,000 instructions per second. Therefore, 20 milliseconds processing time corresponds to an average of 1000 instructions to process a student request. Knowing the average number of instructions needed to process a request permits us to calculate the processing time for other computers. We are designing our new system to provide twice as many instructions (2000 instructions per request on the average). If we consider a modern computer presently available, it is possible to compute at a rate of four to eight million instructions per second. Using the lower rate of four million instructions per second, we find that 2000 instructions require 500 microseconds to process. We want to design the system so that the probability of a student waiting a tenth of a second or longer is very low. We can assure excellent response time by using 1 millisecond instead of 500 microseconds as the average processing time on a fully loaded system. Much of the remaining time can be used for background batch programming. Since each student makes a request every 4 seconds on the average, and we allow an average of .001 seconds to process the request, a fully loaded system can handle 4000 students simultaneously. On the average, we are performing 500 instructions per second for each students.

In order to service requests at this rate we cannot transfer data from disk units with each request. This is 200 words more than is presently utilized. These are 50-bit words, which cost approximately 2¢ a bit or $1.00 per word. For the 4000 terminals we will need 2 million words of extended core memory. The main frame of the computer will cost approximately 2 million dollars, the extended core memory 2 million dollars, and other peripheral equipment, excluding the student terminals, an additional 1 million dollars. Large systems are usually paid for over a 5 year period. The five million dollar central processing system will cost approximately 1 million dollars a year. If the 4000 terminals in the system are utilized on the average of 8 hours a day for 300 days a year, we have approximately 10 million terminal hours of usage each year. This gives a cost of 10¢ per terminal hour. The remaining computer time is available at no cost. As inexpensive as this seems the comparable cost for teaching in the classroom at the primary level is about 27¢ per student hour, and we have not yet included communications costs or the expense of sophisticated terminals. If we allow 10¢ per hour for each terminal based on the same usage as the computer, we can spend 5 million dollars for 4000 terminals or $1,250 per terminal. This terminal must have a graphic display with inherent memory, superimposed randomly selected slide images, randomly selected audio response and a deyset input. At the present time, terminals of this type are not avialable, particularly at $1,250 each.[23]

FUNDING

Office of Education figures show that about 24% of higher education operating funds in 1967 were derived from federal sources.[24] This compares with 12% in 1955. Most of the funds have been used for Research and Development programs. Support programs--grants and loans--were expected to be $4.7 billion in 1969 and $5 billion in 1970. HR35, the National Institutional Grants Program, provides $400 million for 1970 and could give up to $1 billion in coming years for direct institutional support.

Approximately 5% of federal funds available for higher education is used on computer activities. According to the report of the Southern Regional Education Board, total federal support for computers will amount to about $109 million in 1969, of which $62 million was expected to be spent on application, the rest for machine aquisition.[25] The National Science Foundation has a program of support for Computing Activities in Education and Research of $22 million for 1970. Less than $3 million of that sum is for CAI. Total federal funds for CAI presently amount to about $5 million annually. We may reasonably expect a moderate increase in CAI funds for the future.

Total computer expenditures for 1969 were estimated to be $142 million in non-federal funds. About one-third, or $47 million, was state supplied. This represents almost a 32% increase since 1965. Approximately 3% of state funds for computer activities goes to CAI, that comes to about $1.3 million for 1969, $1.5 million for 1970, and $1.7 million for 1971.

Endowments and gifts provide 68.5% of private university funding and 38.5% of public university funds. In 1968, these funds provided 50.8% of the funds for all higher education institutions, down from 56.6% in 1957. The percentage may well continue to decrease. The $9.3 billion this funding represented in 1968 is the major resource, excepting tuition, of many schools. These funds represented about two-thirds of the $142 million non-federal funds--about $94 million--for computer support. CAI support from this source amounts to about $3 million annually.

Industry, primarily computer companies, has supplied about $40 million a year for the past four years. At best, 10% of it has been used for CAI efforts.

FINDINGS

The approximate $300 million sum granted to computer related activities per year is not enough to cover the expenses required to conduct all the necessary computerization, especially since CAI constitutes only a small fraction of the total. While cost predictions with federal assistance in mind are hazardous in view of changing political climates, inflation and other variables, it may be reasonable to assume that federal agencies will, in the long run, provide most of the necessary costs.

Initiating CAI at any school requires a large initial investment. The expense is the first major objection to the computer. In terms of short-term effect, it often seems to be an unwise investment. However, in the long-term, CAI is a cost saving possibility. Spread over many years, for many students, the expenses will not seem as awesome, especially in view of the unique benefits the computer has to offer.

A second objection often raised about the computer is its dehumanizing effect. It seems not to be a particularly valid objection in view of the fact that no program contemplates that a student will use it more than a few hours per week. There is also the consideration that it can add a quite humanizing aspect to education by virtue of its capacity to be infinitely patient with slow learners.

"The man the dog the girl owned bit died" is a sentence from Stanford's elementary school grammar course taught by means of the computer. It is a far cry from: "See Dick. See Jane and Spot. See Spot bite Dick. See Dick die." If the computer sentence seems unfathomable to a pre-World War II educated man, it will seem less unfathomable to a nine year old learning the logic behind it. Perhaps a generation taught in this manner may be able to communicate more accurately. A certainty is that one cannot measure the present and future entirely in terms of traditional values. If machines have produced confusion, it is possible that other machines can help solve the problem.

Ralph W. Gerard has said that the computer is the most important advance in education since the printed word. He warns that if the educational establishment resists technology too long, other groups will undertake educational functions extracurricularly.[26]

A third objection to the computer is from teachers who are unsure of how it might affect their role. The computer cannot lecture, counsel, lead discussions, or conduct labs. It would be unwise to use the computer in Humanities courses in which interpretation is the crux of the course. That the computer replace the teacher is not being suggested by anyone, although learning exclusively from a computer might be no worse than learning exclusively from a bad teacher. The point is simply that the computer can be a powerful tool and ally for the teacher. Among other things, it can provide the teacher with extremely valuable diagnostic material which arises out of the feedback that it accumulates from students as they interact with programmed material.[27]

CAI must be considered when at least one of three conditions exist at a school: the need for individualized instruction, a shortage of qualified instructors, and a plethora of information. With the increase in student enrollment, it becomes less satisfactory to channel students into a limited number of curricula. A student has his own interests and can supply motivation of his own if given the opportunity to pursue his interests at his own pace. Circularly, with more students there are more individual needs. The second condition is more local. There are enough certified teachers in this country, but there are difficulties in getting them to serve in depressed areas which especially need exceptional teachers. The third condition is obviously here. Increasing knowledge has forced specialization, thus destroying the traditional idea of a liberal arts education. In view of the discoveries made in this century, it is reasonable to assume that in the next 40 to 50 years (the career span of a college graduate) the information produced will be still more overwhelming. Since machinery is available for handling huge quantities of information, it may as well be given that task so that individuals can devote their time to more urgent needs.

There are technical problems to be overcome before CAI can be truly extensive: an inexpensive time-sharing computer with all the necessary characteristics for CAI, together with a large number of terminals, must be developed and marketed at lower costs; communication between computer specialist, non-specialist, and machine must be simplified; the many types of computers, input/output devices and programs must be made compatible; it is not uncommon to have a ratio of 300 programming hours per one class hour. Most of these problems are expected to be solved within five to ten years.

There is also a very serious incentive problem standing in the way of extensive development of CAI. An ordinary computer programmer is not equipped to design a college course that makes the best use of CAI; it is necessary for the professor himself to redesign his course in order that it be rationally adapted to CAI. As the academic community is organized, there is no reward to the professor for taking the time and effort to do this. Professors who now redesign courses tend to write down the redesign in a textbook and get the personal recognition that goes with writing a textbook; they also receive recognition in the form of royalties if the book sells well. With that option available, CAI does not stand much chance of being done well.

SUGGESTIONS

A) Since it is the closest approximation to a national organization, EDUCOM should be strengthened.

   1. Legal problems of interchange and copyright should be eliminated.
   2. EDUNET, the information network, whould be developed so that interested schools can receive desired data immediately.
   3. An advisory board should be established to regulate and control experiments, so that repetition can be avoided and all schools can learn or the results.

B) Development

1. Work should continue on applications concerning drill and practice, gaming, labs, problem-solving environments such as medical diagnosis, and programs for the practice of simple skills. In this way, cost-effectiveness of computers can be increased.
2. There should be projects at the college level to test individually prescribed instruction similar to the Oakland-Pittsburgh project.
3. Software encompassing the liberal arts curriculum should be developed.

C) CAI testing has been on a limited scale and in controlled environments so that CAI courses are often considered specialized or experimental. CAI should be tried on a large scale in depressed areas known to lack excellent teaching at the elementary level. CAI might also be tried at the college level in central urban areas where most high school graduates do not have sufficient resources for a college education. In this manner, the public can be well served and valuable information about CAI methodology can be obtained.

D) Teacher education should include study of computer operations and systems. The question is not whether, but when CAI should become commonplace in our schools. Patrick Suppes says immediately; Anthony G. Oettinger says in thirty years. Oettinger is of the opinion that educational technology will have little impact on instruction and learning in the next decade, but he is confident that technology will eventually bring great and beneficial changes to education.[28] Perhaps the time scale may be a compromise between what Suppes and Oettinger suggest. True, there is a technological gap, but no one knows exactly what the next ten or more years will bring. Before computers can become widely useful, they must be understood--there must be confidence on the part of the user. The efficiency of the computer is useless if its capacities and procedures are not known. John G. Kemeny of Dartmouth has predicted that by 1990 computer terminals will be as common in the household as phones and TV sets.[29] It might take that long for the computer to be publicly assimilated. In any case, the public, via the schools, must eventually be educated about the computer and it is none too early for teachers to begin to prepare for that task.

NOTES

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CHAPTER 26

TELEVISION IN HIGHER EDUCATION

Education depends heavily on communication, and television is the greatest mass communications medium yet developed by man. Through satellite-relayed television, virtually the whole world was able to watch together as the first man walked on the moon. Through its ability to see close-up, to bring together events from great distances, to give first-hand rather than reinterpreted accounts, television is constantly bringing "lessons" to millions of sports fans, arm chair adventurers, and news-hungry citizens. Future developments already on the way, such as the large tubeless screen, stereo sound, and two-way communications will make television an even more powerful medium.

TV has many impressive accomplishments to its credit in the form of news coverage and special events, and these have served as superb educational programs. But the larger share of TV has aimed at emptying the pocketbook rather than filling the mind. The fact that commercial TV has grown to a $4 billion a year business is proof of its success. Meanwhile, non-commercial TV has less to spend in an entire year than the three major networks spend on one week's programming.

It has been estimated that the average child of three to five watches 25 hours of television a week; by the age of 18 he has 22,000 hours of TV time; FCC Commissioner Nicholas Johnson has said the average man watches television a total of nine full years, or about three hours a day.[1]

Educational TV programs are now beginning to try to use the full potential of the medium; Sesame Street is the best example thus far. This development may soon make it necessary to radically change traditional school materials and methods farther up the school ladder, if the coming generation of children is to be well served. The repercussions will eventually reach higher education which must deal with that problem at the same time it is trying to adapt the medium to its own purposes.

How far colleges and universities will be able to go in harnessing the full potential of TV is still very much an open question. Certainly the progress made so far appears to be much less than the medium promises.

SOME EXAMPLES OF ITV

The term "education television" (ETV) has been generally used to mean all non-commercial TV; in American usage it has been synonymous with "public television," which also covers a variety of cultural and educational programs for at-home viewers, found on UHF channels. Instructional television (ITV) is used to describe formal school, college or university instruction, which may be transmitted via closed circuit broadcast over the airways, sent over a cable network, or a combination of these.

The Big Ten universities, the first to experiment with radio in teaching, were the first higher education institutions to turn to television. Iowa State University was the first school, in 1950, to broadcast educational programs by television.

In the mid-1950's, the Federal Communications Commission's Sixth Report and Order provided for ETV stations. C. S. Fletcher secured a $5 million grant from the Ford Foundation for the Fund for Adult Education, which later evolved into the National Education Television Organization (NET).

In 1956-1959 more than 1000 college graduates participated in a teacher training TV instruction project linking the Texas Department of Education, teacher training institutions of the State, and eighteen commercial TV stations. Temporary teaching permits were gained after one year of TV courses.

In 1958 the National Broadcasting Company's commercial network offered "Continental Classroom," an early morning program carried over more than 150 NBC outlets. Many colleges participated, but the program was dropped after a few years.

In 1961, the Midwest Program on Airborne Television Instruction began telecasting lessons over two UHF channels from an airplane flying over Montpelier, Indiana. The programs could be received by 13,000 schools and colleges in six states. More than 5 million students were in this area covering 150-200 square miles.[2]

The Nebraska Council for Higher Education has been using the Nebraska ETV network to share credit lessons and supplementary programs which are incorporated into existing on-campus courses. In 1969, twenty-three institutions were affiliated in this program.

The City University of New York established its City University Mutual Benefit Instruction Network (CUMBIN) to handle specialized courses. CUMBIN connects four campuses through closed-circuit TV, allowing such courses to be taught without duplicating instructional costs.[3] Thus, students who once had to take independent study courses or transfer to other schools for these less available courses now need not do so.

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The Higher Education Association for Television in the New York area organized in 1968 in association with ETV Channel 13. It started with 5 members; in 1969 there were 33; in 1970 there were 50.[4]

A closed-circuit TV system connects the University of Michigan Law School with the local court, enabling first-hand study without physical attendance in court. In Louisiana a cable TV system throughout the State allows the subscribing doctors to observe operations in all State hospitals.

The National Center for School and College Television in Bloomington, Indiana, and the Great Plains Instructional Television Library in Lincoln, Nebraska store recorded instructional programs and materials, and provide them on a national basis to TV stations and closed-circuit installations.

Instructional Television Fixed Service (ITFS)

Demands for broadcast TV allocations exceeded the supply in the early 1960's; also many potential educational users were discouraged by the costs of setting up and operating conventional TV broadcast stations. However, microwave point-to-point broadcast systems (ITFS) have been coming into wider use since 1963 when the FCC opened 31 TV channels in the 2,500 to 2,690 megahertz frequency range for education institutions and organizations. ITFS uses low power (10 watt) transmitters, provides the possibility of transmitting simultaneous broadcasts from the same transmitter, and has equipment costs one-tenth or less of UHF or VHF. By 1967, 36 institutions were using ITFS and 15 more were scheduled to begin use.[5]

GENESYS and Stanford Systems

In 1963, the Florida State Legislature Act provided for the establishment of a program of graduate engineering to be taught by TV. The University of Florida was chosen as the center for the Graduate Engineering Education

Systems (GENESYS) operations. The closed-circuit TV network used leased transmission lines; government agencies and industries established their own receiving rooms so that their employees/students would not have to travel to classrooms. A great benefit was that industry paid education costs for its employees.

Stanford University has been using ITFS, broadcasting to industrial employees on four channels, 150 hours a week, covering an area from San Jose to Emoryville, While GENESYS uses the telephone for student response, Stanford, has found FM radio transmitters preferable for this purpose. The engineering courses presented on TV have been the same as those offered to regular classroom graduate students, and taught by the same teachers, but they are broadcast from a studio. A courier distributes the materials and picks up homework daily.

One limitation of these progr[illegible] has been their restriction to graduate students only. Moreover, Stanford has the policy of serving no more outside students than the number enrolled in its regular classrooms.

Public Television

The Carnegie Commission on Educational Television report was an important impetus to increasing the usage of television. The Commission studied the state of non-commercial television, and recommended that a quarter of a billion dollars be given annually to ETV and a similar amount to ITV.[6] Results of the report were the 1967 Public Broadcasting Act and the creation of the Corporation of Public Broadcasting in Congress.

Early in 1970, NET and Station WNDT (Channel 13) in New York, merged to form the Education Broadcasting Corporation (EBC) with $16 million of support from the Ford Foundation. However, both the Corporation of Public Broadcasting and EBC have no direct or immediate plans for ITV. They will continue to serve cultural needs of the general public, with EBC organizing and scheduling among stations, and the Corporation of Public Broadcasting concentrating on programming; it now supplies approximately one-half of the programs found on ETV stations.

EXAMPLES OF THREE ITV PROJECTS

Hagerstown (Closed-circuit)

The system, centered in Hagerstown in Washington County, Maryland, began operations in 1956 and TV has continued as part of the area's educational program. The system which links 45 schools to the Hagerstown studios, can send out six simultaneous lessons by cable to more than 800 TV sets in the county.

TV has changed and improved the County's curriculum. Before TV, few science courses were taught. The experiments showed that 5th graders made two years progress in arithmetic in nine months. In 1961, 42% of the six graders who learned by TV tested two years above their grade level. The County found TV helped in relieving teacher and classroom shortages. TV has provided instruction in special areas, such as music and art; to provide such courses without TV would have cost more than $250,000 and would have required at least 34 additional teachers. Without TV, the County as a whole would need 100 additional teachers and a budget increase of about $1 million for equivalent courses.[7]

Chicago's TV College (Open-circuit)

Chicago City Junior College's TV College was made possible with the co-operation of ETV station WTTW, Channel 11, which lists the programs in papers and magazines, runs spot promotions, and previews TV courses before each semester. The experiment has shown: 1) TV can teach at home; there was little difference in test results between TV and classroom teaching, and where there was difference, it was in TV's favor: 2) it introduced a new group to education--those in their 30's mostly housewives; 3) it created a new interest in education, demonstrating a need to expand education; 4) the more mature and motivated did well in TV courses.[8]

While the at-home student is its primary concern, the program, which may be watched by any viewer, has expanded to accommodate teacher training, direct instruction on campus, teaching gifted high school students, handicapped students, and prison inmates. It provides instruction for local junior colleges. Communication between student and faculty is handled through telephone conferences, mail, study samplers, programmed materials for self-checking, and open meetings.

In its first year the cost per full time registered student was $850.66 compared to the regular student's $421.80. By the fifth year, TV students' costs matched regular students' costs. A TV enrollment of 800 represents the breakeven point. There are about 100 students working for an Associate in Arts degree exclusively via TV, and another 1,000 students combining TV with on-campus courses for that degree.

"Sunrise Semester" (network TV)

In 1957, WCBS in New York and Washington Square College of Arts and Sciences of New York University teamed up for a program, "Sunrise Semester," which went on the CBS network six years later. The show consists simply of a professor in front of a camera; it airs between 5:00 and 7:00 a.m. throughout the country. There are four groups of viewers: 1) those taking it for credit at NYU, for $183 per course, do their assignments and take their final exams on campus; 2) those in some 20 other higher education institutions which allow credit for the series; 3) those who pay a $5 fee to receive a study guide and take a final exam at home without credit; 4) those who just watch the show for its intrinsic interest.[9]

There are strict standards for those who wish to enroll for degree credit. NYU students must have a high school average of 80 and a combined SAT score of 1,000. Other students are requested to submit their transcripts. High school students are not allowed to take the courses for credit. An overall fee of $210 covers the non-refundable application fee, registration, materials, and examination fees. Participating colleges are free to set up their own administrative procedures, tuition schedules, and accreditations.

The great advantage of a network course is that it can reach a very large number of people on a regular basis at the low cost. A 1966 Nielsen Company survey estimated there were 54,921,970 U.S. TV homes, 6,860,000 homes turning to one or more ETV stations a week and 1.2 hours of ETV viewing per home a week.[10] Assuming 2.4 viewers per home, the total number reached by all ETV stations per week exceeded 16 million. The estimated number of students attending higher education institutions is 7.1 million. Many U.S. TV homes are not capable of receiving programs transmitted at ultra high frequency (UHF), used by many ETV stations and ETV stations are absent in many communities. But the number of TV sets and ETV stations has grown substantially since the 1966 Nielson Survey.

EDUCATIONAL TELEVISION ABROAD

While the U.S. government is hesitant to interfere with the corporate nature of American television, in most other countries TV operations are government monopolies. These governments can impose quality standards to a degree which is impossible in the U.S. Less concerned with profit, other countries can more easily harness the resources of TV for education and use it as a cheap and effective way of informing the public.

Sweden

Sweden, for example, plans to change the school into a learning center and the teacher into a counselor by embracing educational technology. In The Education Industry, W. Kenneth Richmond writes:

> The National Board of Education of Sweden believes that conditions now exist for the establishment of courses of systematic training in educational technology. Teachers of specialist subjects are to be seconded for programme writing, film-making and TV production, while others are to undergo intensive retraining as research and development officers. In this way, it is hoped, any loss of academic freedom will be more than recouped. Similarly, commercial firms will no longer be allowed to follow their own initiatives as they have done in the past; instead, they will have to compete for tenders which have the backing of official approval. In the long run, they, like the teachers, stand to gain, for the school equipment market will be greater and the goods produced more serviceable.[11]

American Samoa

Faced with a severe teacher shortage and lack of funds in 1961, Samoa initiated a TV system to help with elementary education. The Island's Department of Education runs a TV station of 100 kilowatts whose signals cover a radius of 100 miles. The concept is maximum usage of TV, using excellant professional teachers. The organization includes: the studio teacher, the producer-director, the research teacher, and the classroom teacher. Each works with the others as a committee; the lectures are reviewed and retaped if opinion is the lecture needs improvement. There are 180 TV lessons each week, taped in advance, for 36 weeks per year. Classes are limited to 30 students. Up to 60 TV lessons a day are broadcast to classrooms equipped with monitors that have six channels.

Commenting on the success of the Samoan program, Harry Skornia, former president of the National Association of Educational Broadcasters, said: "Virtually everything has proved teachable at virtually each age and grade level--with proper use of TV."[12]

Japan

The handbook of Japan Broadcasting Corporation (NHK) notes: "Education by means of broadcasts provides a motive power for the welfare and prosperity of Japan tommorrow,"[13] In 1962, the NHK Correspondence Upper Secondary School was established as a nationwide institution. It publishes its own books and pamphlets, which are available at book stores and NHK stations. Admissions qualifications are the same for any other secondary school; it is open to those who have completed the nine years of compulsory education. The total expense for a correspondence student is inexpensive--about $50. Students are required to attend one of 76 local schools for personal guidance 20 days a year. Students can follow the courses from wherever they live and feel free to move about if they choose, as the TV signals will reach all parts of the Island. Teachers from the NHK School in Tokyo and special lectures travel around the districts twice each year so all students can come into direct contact with in-person teaching.

England

Britain's Open University is just beginning operations and will be most interesting to observe. Born of the Country's economic problems, it will work with the co-operation of the B.B.C. The capital costs are expected to be no more than $12 million, and the annual operating costs are estimated at $7 million. Student fees are not yet decided, but there is expected to be a registration fee of $25, plus a similar charge for each course.

The University will use TV, radio, correspondence, and home experimental kits. A national institution, the central campus will be at Milton Keynes, 50 miles from London, with a full-time faculty of 100 and complete laboratory, computer, and library facilities. The system is planned to include several hundred local centers throughout the country where the students can meet with tutors--drawn from nearby education institutions--and listen to or borrow taped lectures. Each student will be required to take two weeks of full-time instruction in the summer at classroom and lab facilities that the University will "borrow" from various schools in the Country. Most of the course will use correspondence materials, with regular lectures and demonstrations given over TV and radio.[14]

Admission is to be open to those academically qualified, and others who show promise of success. To establish the quality of its degrees, examinations will be held for degree credits. Plans are under way to develop a graduate curriculum.

One drawback is that only 25,000 places are available, while first year applicants alone are estimated to number 100,000. So, whether the Open University will actually be "open"--the "university of the second chance"--remains to be seen. Top priority in admissions will be given to school teachers.

USAGE

According to L.E. McKune's Compendium of Televised Education, there were some 600 closed-circuit TV systems in American educational institutions in 1967, most of which were devoted to instruction. Of the 136 public televisions stations in America, 130 were carrying programs designed for instruction use in the schools. During the 1966-67 school year, there were 227 universities, 836 colleges, 42 seminaries, 49 institutes and 46 TV stations reporting 48 different educational subject listings, with an enrollment of 461,431.[15]

TV has been used in higher education in a variety of ways:

1. Presentation of regular classroom instruction: This is its most common use, as TV provides a relatively inexpensive way to meet large increased enrollments. TV allows students to view presentations by the best professors, live, on film or on tape. The TV monitor can be in a classroom, in a library, or in the dorm.
2. Supplementing the teacher's presentation: TV can improve lecture demonstrations, for instance, magnifying objects previously seen only through microscopes or showing a film to document a statement. TV minimizes the need for duplication of demonstration equipment and set-up time. In short, the TV monitor provides a convenient theatre for all manner of presentations.
3. Televising and recording student performance: This is particularly effective for practice teachers, speech or drama students, and athletes. The student gains experience and can later

evaluate his own performance. A video recorder is necessary; its expense has prevented this application from being widespread

4. Student training in TV techniques or teaching via TV: with more trained for ITV situations, the acceptance and growth of ITV can be expected.
5. Research: TV is used in many fields of university research, for instance, by psychologists studying learning response to simple visual stimuli, or studying social awareness, attitude formation in the context of video-taped programs, which can be played over and over again to map responses of various types of individuals.
6. Testing: The most common way this has been used is in presenting problem situations to solve. Testing by TV is still a relatively new area. Its use in presenting multiple choice questions in new forms, in conjunction with electronic response devices, may soon become important innovations.

Though the above have all been in use, a great potential for further development, experimentation, and organization remains largely unfulfilled in most cases.

ADVANTAGES AND DISADVANTAGES

The advantages usually cited for ITV are:

1. Ease of communication: Through TV, students can be brought into intimate contact with great teachers.

2. Sense of reality: Public figures can be interviewed, their expressions and emotions observed at close range.
3. Unique technical assets: The abilities of TV for cuts, juxtaposing remote events, close-ups, etc. open up new opportunities for presentation, interpretation, and dramatization.
4. Timeliness: TV may transmit timely events almost instantaneously over great distances.
5. Special motivation: TV can capture the public's imagination and produce the concern and motivation required as a basis for effective learning.

The disadvantages usually cited against ITV are:

1. The lack of reciprocal relationships established between professor and student.
2. The lack of flexibility where one must contend with a fixed presentation for heterogeneous interests, knowledge, and capacities.
3. The necessity to conform a great many schedules to the TV schedule.
4. The absence of direct physical contact.

Probably the major roadblock to ITV usage has been the negative response from faculty and administration. In general there is opposition to all forms of educational technology; at least it is often seen as an added burden to bear in an already complicated schedule and pattern of responsibilities; at worst it is seen as a direct threat to the instructor's existence. Contrasting the pro and anti-ITV professor in Resistance to Innovation in Higher Education, Evans and Leppmann note:

> ...we may picture the pro-ITV professor as being more adventuresome, flexible, and mobile in his thinking and teaching. His concern is not limited to the narrowly defined academic aspects of the university; rather, he tends to see the university as a social as well as academic community...he is far more willing to experiment with new methods and techniques than his anti-ITV colleague. However, in regard to innovations which affect the social aspects of the university, he may be less willing to support change...We find that the anti-ITV professor is narrowly focused on questions and events which revolve around the traditional academic framework...He perceives himself as being highly competent in his chosen profession, and thus, he spends more time doing what he thinks he does best--teaching by traditional methods. He sees as the greatest threat those forces within his environment which might "dilute" the academic aspects of the university, or alter his role within it.[16]

Student acceptance has been more favorable, particularly when the reasons for ITV are explained. W. J. McKeachie has noted:

> Attitudes of students toward the media are probably not a direct measure of their educational values. Studies of student attitudes toward teachers...films...and television...indicate only small relationships between "liking" and learning outcomes.[17]

Students seem to learn regardless of the medium.

EVALUATION

Robert Dubin and R. Alan Hedley's 1969 publication, The Medium May Be Related to the Message, is a study of research experiments on ITV. They conclude that instructional television is just as good or bad as other college instructional methods.

Their conclusions include the following:[18]

1. In one-way TV versus face-to-face instruction, 59.5% favored ETV, 39.2% favored face-to-face.
2. In face-to-face instruction versus to-way TV, 22.9% favored ETV, 77.1% favored face-to-face.

3. In face-to-face versus ETV when a lecture was employed, 42.5% favored ETV, 55.9% favored face-to-face.
4. In the difference between lecturing face-to-face or by one-way TV, 50% favored ETV, 47.9% favored face-to-face.
5. In the teaching of Humanities, 63.5% favored ETV, 36.5% favored face-to-face.
6. In Psychology, 68.2% favored ETV, 31.8% face-to-face.
7. In Social Sciences, 59.2% favored ETV, 38.8% face-to-face.
8. In Math and Science, 45.1% favored ETV, 52.9% face-to-face.

A 1966 comparison at Michigan State University between closed-circuit TV teaching and classroom teaching without two-way communication showed that if TV lectures were available in the student's residence, 65% would prefer TV over conventional methods; if TV lectures were on at a more convenient time, 70% would take TV; if all sections of a given class were filled, 75% would take the TV course.[19]

G. C. Chu and W. Schramm have said:

> While the previous comparisons made by Schramm indicated that instructional television had, on the average, some what less success with humanities than, for instance, with natural science, the more recent comparisons we have made suggest just the opposite. The over-all impression one gets from the two summaries of comparisons seems to be: So far as we can tell from available research evidence, there is no general area where television cannot be used efficiently to teach the students.[20]

These evaluations refer to primitive uses that have not exploited the most important, unique characteristics of the medium in lesson preparation and presentation.

This is not true of "Sesame Street" which makes sophisticated use of the medium. The Educational Testing Service recently carried out an evaluation of "Sesame Street" which showed a substantial gain in learning among those who watched the show regardless of environment. Those who watch the show more gain more; those who discussed what was presented with their parents learned faster than those watching alone.[21] The last finding suggests TV will not make the teacher obsolete.

There still remains a great deal to be done before we have a thorough evaluation of ITV. Meanwhile, Brian Groombridge points out in Adult Education and Television:

> The justification for expressly educational broadcasting... is the same as the justification for socially organized education itself. Often the purpose is thwarted; the teacher is incompetent; the school is bad; but it is better to have schools than not. So it is better to have educational television than not.[22]

COSTS AND FUNDING

Studies of the economics of ITV are necessarily tentative; technology and costs are changing rapidly, and often basic assumptions about equipment, use, lesson preparation have a short life. In 1958, Carpenter and Greenhill suggested the costs were feasible for courses with more than 200 students.[23] E. I. Seibert's 1958 study indicated cost advantages in courses with 150 to 270 students.[24]

Estimating capital and operational costs of an educational station is risky. Capital costs for most ETV stations average about $500,000 but vary widely. Operating budgets for in-school television may range from $1,000 to $650,000, depending on the system. The medium cost for producing a half-hour in-school program is about $200; an ITV series of 30 programs may cost approximately $75,000.[25]

Federal support for ITV has come from cost-shared funds covered by Title VI of the Higher Education Act of 1965. Section 601(e) on ITV was amended in 1968 to authorize $10 million for 1970 and 1971 each. However, a like sum was promised for 1969 and only $1.5 million was appropriated. Section 601(a) provides for equipment acquisition and the figure of $60 million was authorized for 1970 and 1971 each. However, in 1969 only $14.5 million was appropriated.[26]

CONCLUSION

The 1970's will be critical years for instructional television, and a period during which the entire TV industry may change. Eugene Moon of the Community Cablevision Company of Newport Beach reports there are approximately 2,500 CATV systems in operation, serving 3,700 communities, averaging 1,850 people per system. In ten years, an estimated 7,500 systems will serve 30 million homes.[27] Eventually any town with TV sets may be serviced with cable lines.

With the emergence of cable television, the FCC is considering making 20 to 80 channels mandatory for new TV sets. When a TV set can receive such a large number of channels, the programming can be much more varied and extensive than that found on commercial TV.

If a TV channel broadcasted college courses 12 hours daily, there would be 4,380 course-hours annually. About ten channels would be required to handle a university's curriculum.

Teleprompter Corporation--the largest CATV firm--and its principal stockholder, the Hughes Aircraft Company, is reportedly planning a satellite relay system that may carry 100 channels.

Video-tape recorders, copying machines, and other devices which might be integrated into an educational TV system are being mass produced. The possibility or even likelihood of a national cable network, in conjunction with satellite relay stations, laser beam signal carrier could dramatically change the cost and the fundamental nature of the nation's entire communications operation. Burglar alarms, shopping, billing, banking and credit card verification, two-way video links and many more functions might be integrated into such a system.

Meanwhile, there are today some 25 million adults following adult education courses at schools, libraries, churches, business establishments, and union halls. The idea continues to spread: education, if one is interested, does not end at age 18 or 21. Television makes it extremely convenient to watch educational courses by eliminating the necessity to spend time driving to schools and parking.

Marshall McLuhan has written:

> If we ask what is the relation of TV to the learning process, the answer is surely that the TV image, by its stress of participation, dialogue, and depth, has brought to Americans new demands for crash-programming in education.... The revolution has already taken place at home. TV has changed our sense-lives and our mental processes. It has created a taste for all experience in depth that affects language teaching as much as car styles....Not only deeper, but further, into all knowledge has become the normal popular demand since TV.... Merely to put the present classroom on TV would be like putting movies on TV. The result would be a hybrid that is neither. The right approach is to ask, "What can TV do that the classroom cannot do for French, or for physics?" The answer is: "TV can illustrate the interplay of process and growth of forms of all kinds as nothing else can."[20]

The fact that ITV results have been comparable to classroom teaching says little about ITV's real educational potential, or about what to expect of the young students born and bred on media.

Dr. George Steiner of San Francisco State College says previous exposure to technological methods will mean student improvement in each progressive course taught with technology.[29] The combination of computer and television may be the dominant mode of education in the future. The computer will help the student choose the most suitable course and format for him and use the TV screen as one tool of CAI.

If today's higher education is to be opened up to the millions of people unserved by universities because of financial and other restrictions, ITV appears to offer the best, perhaps the only, solution.

Today's youth is changing; TV has played a major role in that change. Every generation inherits all the benefits and burdens of preceding generations. Today's young generation has a very complicated burden to shoulder and must make full use of every asset it can find.

SUGGESTIONS

1. A non-profit ITV agency, federally sponsored but independently managed should be established. It would consist of educators, administrators and students to coordinate and regulare all ITV affairs. The Federal Communications Commission has become identified with the needs of commerce; it should, therefore, have no direct control over the educational application of television. The creation of COMSAT and the Corporation for Public Broadcasting, both federally sponsored independent agencies, emphasizes the

importance of television and communications; a national ITV agency is the next logical step.

Within the national ITV office, blue ribbon committees in each field of study should be formed to advise and guide the development of ITV in each subject area, and should make recommendations on curriculum.

An excise tax on each new TV set sold might be levied to help pay for the work of the national agency. A more regular source of revenue would be an annual registration fee levied on each TV set. England has such an annual tax which, if introduced in America, would raise nearly a billion dollars annually.

2. A definitive system cost study should be undertaken, examining requirements for network channels, equipment and facilities, programming, research and development and personnel.
3. Resource centers must be created. Richard Meyer, director of the school TV service for WNDT-EBC, says that "almost no institution of higher education in the United States is experimenting with the software or programming aspects of the medium."[30] These centers would include teachers, writers, and film makers who would examine how media affect people and apply the results to teaching. These centers might be especially useful in ghetto areas where young people could be educated, trained for careers in broadcasting, and prepared for higher education institutions.
4. Every major college and university should have a Media/Communications Department. Television is much too important and vital in the American life style to not be extensively studied and used.

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PART IV

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As a matter of convenience this bibliography is divided into the following general headings:

- GENERAL INTEREST
- ACADEMIC FREEDOM
- ADMINISTRATION
- ADULT EDUCATION
- BIBLIOGRAPHIES, PUBLICATIONS LISTS AND DIRECTORIES
- CAMPUS UNREST
- THE DISADVANTAGED
- EDUCATION AND EMPLOYMENT
- EDUCATIONAL RESEARCH
- FACULTY
- FINANCE
- THE FUTURE
- GRADUATE EDUCATION
- HIGH SCHOOLS
- INNOVATION
- INTERINSTITUTIONAL STUDIES
- INSTITUTIONAL RESEARCH
- LIBRARIES
- PLANNING
- PUBLIC POLICY

(continued)

SPECIFIC INSTITUTIONS AND AREAS

THE STUDENT

SYSTEMS ANALYSIS

TEACHER TRAINING

TECHNOLOGY

TWO AND FOUR-YEAR COLLEGES

MISCELLANEOUS

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